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ABSTRACT

This sourcebook is one of several supplementary materials for a 16-week newspaper course about oceans. Program ideas and sources of related resources compiled in this sourcebook are designed to help civic and group leaders and educators plan educational community programs based on the course topics. Section one describes ways in which the multidisciplinary program is useful in community and academic programs. Section two, Resources for Educational Community Programs, suggests background reading in specific periodicals and books, and discussion questions for each of the six course units. Section three provides a guide to additional resources such as films, speakers, and publications from ten federal agencies, 23 private organizations, and 50 state agencies and interest groups. These include the National Sea Grant Program, National Geographic Society, and the Oceanic Education Foundation. Section four comprises an annotated bibliography of 84 films on sea-related topics including pollution, exploration, ancient sea stories, and political controversies. Names and addresses of nine organizations for concerned citizens to join are presented in section five. (Author/AV)

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SOURCE BOOK

FOR

OCEANS

OUR CONTINUING FRONTIER

By

Mary Hellman

A Project of Courses by Newspaper, University Extension
University of California, San Diego
Funded by the National Endowment for the Humanities

SP 009 956

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PREFACE

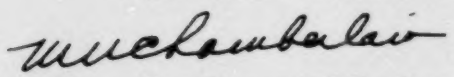
Beginning in the fall of 1976, diplomats from throughout the world reconvene the United Nations Conference on Law of the Sea to continue their efforts to write an international body of law to govern the oceans. At the same time Courses by Newspaper's timely series on the oceans begins to appear in newspapers across the United States.

Prepared under the direction of Professor H. William Menard of the Scripps Institution of Oceanography at the University of California, San Diego, this sixteen-week series will focus public attention on the potential of the seas as well as their continuing broad impact on civilization. A review of the course topics — the oceans' impact on art and literature, new knowledge of earth's history derived from study of the oceans, the seas' valuable resources, their importance to international order, and their allure as a place to work and play — clearly shows why this series is must reading for concerned Americans regardless of where they live.

Those of us who have been part of the creation of this exciting series are hopeful that it may become the basis for community discussions on the oceans in much the same way as Courses by Newspaper was the basis of American Issues Forum discussions during the bicentennial year. To encourage broad public discussion based on the topics of "Oceans: Our Continuing Frontier" is the purpose of this *Source Book*. Its lists of resources and imaginative program suggestions both simplify program planning and help insure that group discussions will be meaningful learning experiences for all those involved.

With our ever growing knowledge of our planet's last frontier comes increasing responsibility for judicious development of its potential. Indeed, the oceans are a precious natural resource that must be both shared and guarded by all the earth's peoples. It is our hope that this Courses by Newspaper series will heighten public awareness of the crucial issues to be confronted as mankind charts its future course on the world's seas.

Martin N. Chamberlain



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INTRODUCTION

This *Source Book* was developed in conjunction with Courses by Newspaper's efforts to broaden the impact of its Fall 1976 program "Oceans: Our Continuing Frontier." Specifically, the program ideas and sources of related resources compiled in this publication are designed to help civic and group leaders and educators plan educational community programs based on the course topics.

In preparing this publication, I enjoyed the unstinting cooperation of several organizations. One that deserves special mention is the Educational Film Library Association (EFLA). Under the efficient direction of Nadine Covert, EFLA researched the comprehensive filmography that simplifies the addition of a provocative visual dimension to discussions of the course topics. All of the federal agencies, private organizations, and interest groups listed in Section III also deserve a special thank you for their willingness to contribute resources in the form of speakers, films, and publications and to assist persons planning discussion sessions.

References to selections from the Courses by Newspaper Reader *Oceans: Our Continuing Frontier,* and to the bibliographies from the *Study Guide* were derived from selection headnotes in the Reader and the annotated bibliographies in the *Study Guide.* In this endeavor, I benefited from the careful research and editing of Jane L. Scheiber, Courses by Newspaper's editorial director and coeditor of the Reader.

Courses by Newspaper's Project Director George A. Colburn helped conceptualize this publication and provided many constructive suggestions and much encouragement during its drafting. Also vital to the success of this project were my concientious typist Mary Robinson and my exacting editor Nancy Sjoberg.

Finally I wish to thank the National Endowment for the Humanities for its generous funding and support of this project.

M.H.

SECTION I

COURSES BY NEWSPAPER:

A Catalyst for Educational Community Programs

Fall 1976 Program and Materials

Suggested Uses by Community Groups

Suggested Uses by Educational Institutions

COURSES BY NEWSPAPER: A Catalyst for Educational Community Programs

What is Courses by Newspaper?

Courses by Newspaper is a successful nationwide continuing education program. For the past three years, Courses by Newspaper has prepared courses on topics of significant current interest that are offered for credit with the help of participating newspapers and colleges or universities across the country. During the program's brief history, more than 20,000 newspaper readers have earned valuable college credit, while millions of others, by reading the weekly course articles in their local newspapers, have used Courses by Newspaper to broaden their horizons or refresh their knowledge.

Since its origination by University Extension, University of California, San Diego, Courses by Newspaper has appeared in more than 500 newspapers across the nation and has been offered for credit by more than 250 two- and four-year educational institutions.

In addition to serving as the basis for a credit course, in what other ways can Courses by Newspaper be used?

Recent experiences with Courses by Newspaper's bicentennial program, American Issues Forum, have proved that the course outline is an excellent catalyst for community or group discussion meetings. When used in this way, the timely course topics become the themes for monthly or weekly meetings of civic, religious, educational, and community groups and for regularly scheduled noncredit programs such as lecture or film series sponsored by educational institutions. Using the course outline and the course articles as convenient guides, a variety of exciting educational programs can be planned to bring concerned citizens information about current issues of broad public interest.

To encourage and simplify the use of Courses by Newspaper's Fall 1976 program in educational discussion meetings is the purpose of this publication.

Fall 1976 Program and Materials

What are the details of the Courses by Newspaper topic for Fall 1976?

In Fall 1976, Courses by Newspaper examines the whole range of human involvement with the sea in its series "Oceans: Our Continuing Frontier." Led by Professor H. William Menard of the Scripps Institution of Oceanography, this voyage into earth's last remaining frontier coincides with the reconvening of the United Nations Conference on the Law of the Sea, "the most comprehensive and critical negotiation in history," according to one diplomat. Many of the hotly debated agenda items of this conference are among the topics in the Courses by Newspaper series. Below is an outline of the course articles and their authors.

OCEANS: OUR CONTINUING FRONTIER

Unit One: Introduction

1. Our Continuing Frontier

   H. William Menard—the coordinator of this Courses by Newspaper series, who is professor of geology, Institute of Marine Resources, Scripps Institution of Oceanography, University of California, San Diego, a consultant to various federal agencies and industries, and a veteran of a score of deep-sea expeditions. His books include *Anatomy of an Expedition* and *Geology, Resources and Society.*

Unit Two: Literature and Art

2. Writers at Sea: From a Vanishing Breed, a Legacy of Majestic Tales

   George Elliott—a novelist, poet, and essayist who is professor of English at Syracuse University.

3. Horrors of the Deep: Monsters Now "Dwindling in Reputation and Number"

Eugenie Clark—professor of zoology at the University of Maryland, the former director of the Cape Haze Marine Laboratory, Sarasota, Florida, and the author of *Lady With a Spear* and *The Lady and the Sharks.*

4. American Imagery and Visions of the Sea: Reflections of the National Mood in Marine Painting

John Wilmerding—the Leon E. Williams Professor of Art at Dartmouth College who has written *A History of American Marine Painting* as well as books on artists Fitz Hugh Lane, Winslow Homer, and Robert Salmon.

Unit Three: Science and Myth

5. Exploration of the Sea: Scoring Breakthroughs With an Advanced Technology

and

6. A New World Picture. From Beneath the Sea, Proof the Continents Move

Sir Edward Bullard—professor of geophysics at the Institute of Geophysics and Planetary Physics, University of California, San Diego, who was knighted for his accomplishments as director of the National Physical Laboratory, Teddington, England, and as chairman of geodesy and geophysics at Cambridge University.

7. Science and Ancient Sea Stories: Scientific Explanations of Legends of the Sea

Willard Basom—a sea explorer and award-winning film producer who is director of the Southern California Coastal Water Research Project to analyze the effects of waste disposal in the ocean and the author of *Hole in the Bottom of the Sea.*

Unit Four: Marine Resources

8. Mineral Resources of the Ocean: A Race for Riches on the Ocean Floor

Don E. Kash—professor of political science and director of the Science and Public Policy Program at the University of Oklahoma and an advisor to the congressional office studying the impact of gas and oil development in the Atlantic. He is the coauthor of *Energy Under the Oceans* and *North Sea Oil and Gas.*

9. Can the Sea Feed the Land? The Future of Aquaculture and Fishing

C.P. Idyll—a marine biologist at the National Oceanic and Atmospheric Administration, advisor to the United Nations Food and Agriculture Organization, and the author of *The Sea Against Hunger.*

10. Pollution...Is the Sea Dying? "Symptoms of Illness, A Prescription for Recovery"

Bostwick H. Ketchum—associate director of the Woods Hole Oceanographic Institution, lecturer and associate member of the Department of Biological Oceanography at Harvard University, and coauthor of *Marine Fouling and its Prevention.*

Unit Five: Policy and Sea Power

11. Law of the Sea: A Critical International Debate

William T. Burke—professor of law at the University of Washington whose books on the legal questions in ocean development include *The Public Order,* considered the most comprehensive recent treatment of the law of the sea.

12. The Sea: Defensive Barrier or Invasion Path?

and

13. The Sea: Connector or Barrier?

Herman Kahn—director of the Hudson Institute, Croton-on-Hudson, who is a former advisor to the Atomic Energy Commission, the Oak Ridge National Laboratory, and the office of the Secretary of Defense, and author of *On Thermonuclear War* and coauthor of *The Year 2000.*

Unit Six: Men and Women at Sea

14. Ships and the Sailor: A Harsh, Dangerous, Lonely Existence

J. H. Parry—the Gardiner Professor of Oceanic History and Affairs at Harvard University whose books on the history of sea exploration include *The Spanish Seaborne Empire, Trade and Dominion,* and *The Discovery of the Sea.*

15. Women and the Sea: Little Progress in Masculine Territory.

Constantina Safilios-Rothschild—professor of sociology and director of family research at Wayne State University, consultant to the United States Navy on the sociology of naval families, and the author of *Women and Social Policy.*

16. From Work to Sport: The Challenge of an "Unpredictable Enemy, A Fascinating Friend"

Heywood Hale Broun—a newspaperman and television and radio personality well known for his descriptive sports reporting on the CBS News Network and author of *A Studied Madness.*

Are there supplementary materials for "Oceans: Our Continuing Frontier"?

A selection of though-provoking readings that correspond to each of the course topics has been gathered into a lively anthology, *Oceans: Our Continuing Frontier.* Drawing on the works of novelists, poets, artists, scientists, diplomats, lawyers, economists, and sociologists, this book chronicles the impact of the seas on civilization and the impact of civilization on the seas. Editors H. William Menard, course coordinator, and Jane L. Scheiber, editorial director of Courses by Newspaper, carefully chose the personal narratives, fictional pieces, critical essays, poems, documents, and excerpts from major literary classics that constitute the anthology. Among the many illustrations in the book, available in both paperback and hardcover, are classic examples of marine painting, arts and crafts.

A companion *Study Guide*, containing overviews that interpret the newspaper and anthology articles, bibliographies, a summary of key concepts, and suggested study questions, is also available.

Both *Oceans: Our Continuing Frontier* and the *Study Guide* can be ordered by completing and returning the coupon in the back of this book.

How can I find out if Courses by Newspaper is available in my area?

A list of participating newspapers, universities, and colleges is available from Courses by Newspaper, University Extension, University of California, San Diego, Q-056, La Jolla, CA 92093. Phone (714) 452-3405.

If there is no participant in your area, Courses by Newspaper will work with interested parties to involve local newspapers and/or educational institutions.

Suggested Uses by Community Groups

How can I use the Courses by Newspaper topics in planning programs for my organization?

The Courses by Newspaper series "Oceans: Our Continuing Frontier" provides a convenient outline of educational program topics for weekly or monthly meetings. Those organizations that meet every week can examine each of the sixteen weekly topics. Those groups that meet monthly can focus on the six unit topics or on a selection of the weekly topics that reflect the group's interests.

Because each of the topics is rich with ideas and points of view, meeting formats can be varied to achieve maximum group interest and participation. For example, one meeting might include a group discussion of the topic led by the course instructor at the local college or university. Another could feature a discussion by a panel whose members represent differing viewpoints. Another could conclude with a speaker who would comment on issues raised in a film shown at the beginning of the meeting.

To assist you in planning these meetings, a variety of program ideas for each of the course topics, as well as suggested discussion questions and books to review, is found in Section II of this book. In Section III is a listing of private and public organizations that will provide resources such as speakers, films, or handouts to enrich your meetings. And in Section IV is a filmography researched by the Education Film Library Association that suggests several provocative and informative films for each weekly topic. Most of these films are available from community or educational film libraries for modest rental fees.

How can I use Courses by Newspaper materials in my group's meetings?

Group discussions of the course topics can be enriched through use of the course materials. In preparation for your group discussions, members can be asked to read the Courses by Newspaper articles at home and to prepare a list of questions or thoughts to bring to the next meeting. These concise articles provide historical perspectives on the issues under consideration; they explore current thinking and opinions on several facets of each issue; and, finally, they raise questions about assumptions, traditions, interpretations, and proposals for the future.

The Courses by Newspaper coordinator (generally in the editorial department) at a participating newspaper will be happy to provide information about its schedule for publication of the articles, and this information can be relayed to members in your newsletter or meeting announcement.

For additional perspectives and points of view, the Courses by Newspaper Reader *Oceans: Our Continuing Frontier* is an excellent source. Either the entire group can read the relevant selections (which are listed for each weekly topic in Section II), or one or more members can be asked to read and then summarize them for the rest of the group at your meetings.

This anthology ($5.50 per copy for paperback, $11.95 for casebound) can be ordered by mail, using the convenient coupon printed in a participating newspaper or by writing Publisher's Inc., 243 12th Street, Drawer P, Del Mar, CA 92014 (please see coupon at the back of this book). Groups planning discussion sessions in conjunction with the newspaper series may order books for their members at discount prices. It may also be available in the bookstore of a local college or university that is participating in the Courses by Newspaper program.

Both the newspaper articles and the readings can serve as take-off points for group discussions during your meetings. When confronting a new issue, this is one procedure you might want to follow: First, consider the historical evolution of the issue; then, react to current thinking on the topic; challenge individual assumptions; and conclude the discussion by attempting to reach a consensus among your members on a future course.

As a discussion leader, what can I do to enrich these sessions?

Throughout the discussion, refer to the Courses by Newspaper articles and readings. Read aloud passages that will put the discussion in perspective, introduce a new angle, or raise new questions. In planning your group's discussion sessions, take advantage of the *Study Guide* for "Oceans: Our Continuing Frontier." Included in it are references to additional points of view on each topic, a comprehensive bibliography of topic-related books, and suggested discussion questions. (Additional discussion questions and a sampling of the *Study Guide* bibliography can be found in Section II of this book.)

Articles in popular periodicals on the topics can also be used to enrich group discussions. Included in Section II is a list of magazine articles related to each topic and generally found in most public libraries. These articles can be reviewed by one or more members in advance of meetings and used to stimulate group discussions.

How can the college or university participating in Courses by Newspaper help?

Your local participating college or university can provide a wealth of resources that will be useful in planning your group's programs on the course topics. As part of their involvement in Courses by Newspaper, many educational institutions are sponsoring films and/or lecture series on the course topics, and some are offering special sessions of the Courses by Newspaper class that are open to members of the community not taking the course for credit.

Members of your group who want to broaden their understanding of the course topics might want to enroll at a local college or university in the Courses by Newspaper program either for credit or noncredit. They might also be encouraged to attend events on campus related to the Courses by Newspaper program.

Your local college or university is also an excellent source of guest speakers, resource persons, and discussion leaders. The course instructor, the continuing education or extension office, or the public affairs office usually can help you locate the person you are seeking.

Suggested Uses by Educational Institutions

As the course instructor, how can I enrich my Courses by Newspaper class for enrolled students?

Because it is an innovative program in continuing education that attracts many nontraditional students, Courses by Newspaper encourages imaginative efforts to enliven classroom meetings. Courses by Newspaper also urges instructors to increase the number of meetings with students enrolled in the course for credit to promote maximum discusion of the topics. However, to maintain the flexibility of the course, it is suggested that these additional meetings be optional.

"Oceans: Our Continuing Frontier," a multidisciplinary course, provides many opportunities to invite guest speakers from other academic departments. These speakers should be selected not only for their expertise, but also for their ability to stimulate lively discussions. Speakers also can be drawn from among the numerous public and private organizations that are informed on one or more of the course topics. A sampling of these organizations can be found in Section III of this book.

Films selected from the filmography in Section IV also can be used to enrich class discussions. Many of the films listed are designed to spark discussions of the topics by presenting a variety of points of view as well as historical background and future forecasts. The program suggestions in Section II, which frequently combine a film showing with a guest speaker or panel discussion, lend themselves to implementation in the classroom.

How can I broaden the impact of my Courses by Newspaper program?

When you have completed planning your classroom sessions, consider inviting the general public to attend. Surveys conducted by Courses by Newspaper have shown that many newspaper readers regularly follow the series but do not need college credit and, therefore, do not enroll in the course. However, many are likely to attend public forums on the course topics.

In planning your public sessions, try to achieve the broadest community involvement possible. Perhaps a local community group or an organization with a special interest in the oceans can be invited to become cosponsors of the public sessions. Or a local high-school teacher can be invited to involve his or her classes in the program and the public sessions. This type of community participation not only broadens the impact of the course but familiarizes the public with your institution and its programs.

To reach and involve Courses by Newspaper readers in your area, publicity is essential. The local newspaper carrying the Courses by Newspaper series, of course, usually will be happy to publicize events related to the series that offer a service to their readers. However, be certain also to contact local television and radio stations, provide them with a schedule of your programs, and encourage them to cover the sessions.

Students enrolled in the course for credit can be asked to come before or stay after the public programs to raise questions of special concern to them. If you prefer meeting with the enrolled students separately, consider scheduling an additional contact session for students only.

How can I use the Source Book to assist me in preparations for my Courses by Newspaper classes?

Because "Oceans: Our Continuing Frontier" is a multidisciplinary course, it is assumed that most course instructors will be familiar with only portions of the subject matter. For those seeking background information on specific topics, Section II of this book should be helpful. In addition to references to selections in the Courses by Newspaper Reader *Oceans: Our Continuing Frontier* and to the bibliographies in the *Study Guide*, there is for each course topic an annotated list of current writing appearing in popular periodicals.

Because many are the subjects of current research and/or debate, the course topics will continue to be the subjects of articles in both popular and scholarly periodicals. The following magazines frequently carry in-depth articles on the course topics: *Oceans, Sea Frontiers, National Geographic, Scientific American, Audubon, The Smithsonian, International Wildlife, Science, Saturday Review, Fortune, Business Week, Sports Illustrated,* and *The New York Times Magazine.* For up-to-date articles on course topics in these magazines, consult the *Readers Guide to Periodical Literature.*

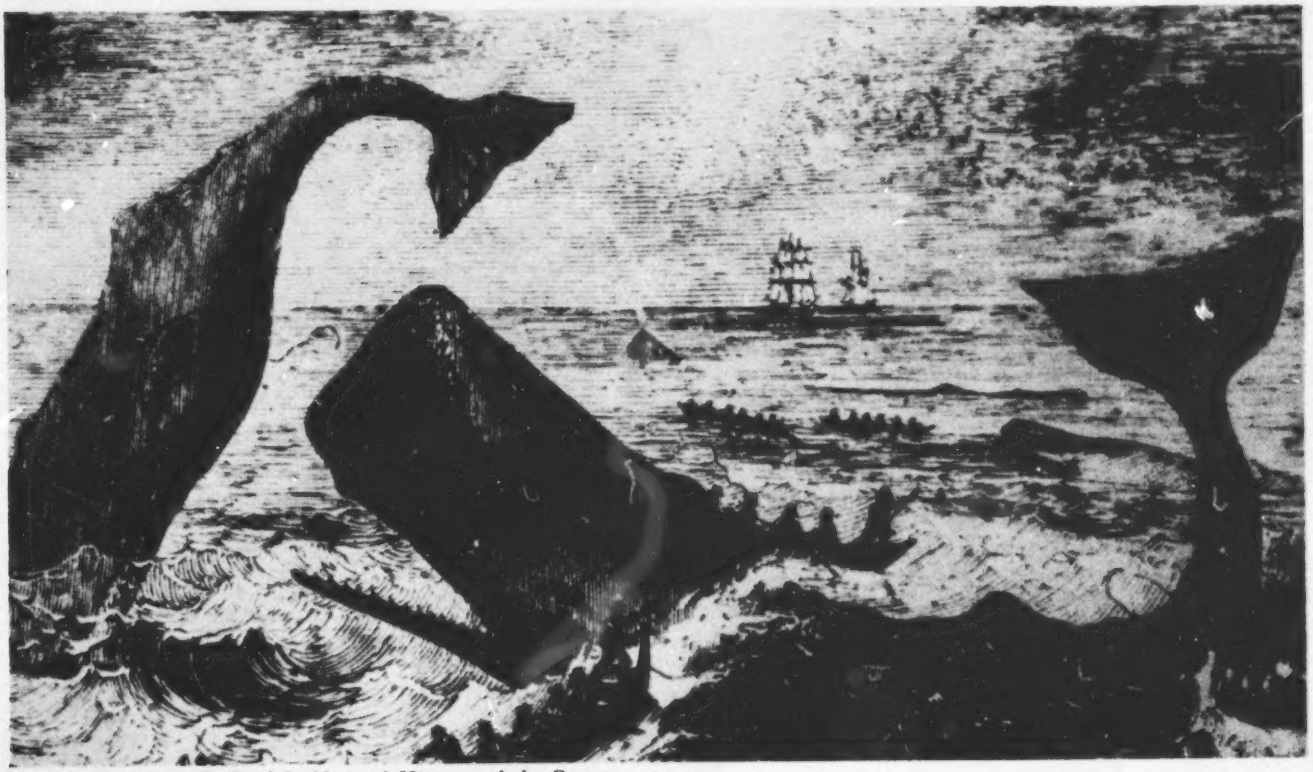
For information on current scientific research, consult the many technical publications in each field such as *Marine Technology Society Journal* or *Under-Sea Technology* or a nearby Sea Grant college or institution. Contacts for the Sea Grant colleges and institutions can be found in Section III.

SECTION II

RESOURCES FOR EDUCATIONAL COMMUNITY PROGRAMS

Because of their richness—and sometimes controversial nature—each of the topics for "Oceans: Our Continuing Frontier" inevitably suggests an abundance of program ideas; thus, it has been impossible to provide more than a sampling of these ideas on the following pages. It should also be noted that none of the program suggestions included in this book is meant to reflect or condone any one point of view; rather, each suggestion is designed to provide a framework, or a point of departure, for group discussions. Individual community leaders and course instructors are strongly encouraged to adapt or modify these suggestions to suit the interests and concerns of his or her particular group.

Suggestions presented for each weekly topic include ideas for films, speakers, debates, surveys, and panel discussions. Also included are books to review, selections to read in the Courses by Newspaper Reader, *Oceans: Our Continuing Frontier* and in popular periodicals and discussion questions. Information on public and private organizations that can provide additional resources, such as speakers, films, and handouts on specific course topics, are listed in Section III. A complete filmography for the course, compiled by the Educational Film Library Association, can be found in Section IV.



Frontispiece from T. Beale's *Natural History of the Sperm Whale*, 1839.

Unit One: Introduction

1. OUR CONTINUING FRONTIER

"Once the whole world was a frontier challenging man. Now the land is explored, occupied, and bursting with people. Only the sea remains as Byron described it, 'dark—heaving—boundless—endless and sublime.' It is to this frontier that people turn increasingly in the hope that it will offer the riches of frontiers that are gone—or because it seems the last hope."

—H. William Menard

Background

From the Courses by Newspaper Reader

OCEANS: OUR CONTINUING FRONTIER

They Went to Sea. Pulitzer Prize-winning historian Samuel Eliot Morison describes the beginnings of American enterprise on the sea.

The Influence of Sea Power Upon History. Alfred Thayer Mahan, a naval officer and historian of the late nineteenth century, argues for expansion of the navy, merchant marine, foreign trade, and overseas bases.

Menfish. Captain Jacques Cousteau conveys the delight of his first experience of freedom under water, made possible by his invention of the aqualung.

The Perils and Potentials of a Watery Planet. Captain Cousteau assesses the promise the sea holds for humanity and the dangers inherent in the exploitation of that promise.

From Popular Periodicals

Author William Wertenbaker chronicles the recent discoveries about the sea and the earth by recounting the life of Maurice Ewing, often called the father of oceanography, in the November 4 (pp. 54-58+), November 11 (pp. 52-56+), and November 18, 1974 (pp. 60-62+) issues of *The New Yorker*. (A portion of this excellent series is reprinted in the Courses by Newspaper Reader. See the selection entitled "The Floor of the Sea.")

Economist Barbara Ward shows why the environment must be a prominent concern in the international debate on law of the sea in "Mankind's New Target: The Vulnerable Oceans" in the Autumn 1974 issue of *Living Wilderness* (pp. 7-15). Ms. Ward's article is the introduction to *Toward an Environmentally Sound Law of the Sea*, a report by the International Institute for Environment and Development, which she founded and serves as president. Copies of the report, at $1.50 each, are available from the International Institute, 1525 New Hampshire Avenue, N.W., Washington, D.C. 20036.

A good overview of the issues still being debated by law of the sea delegates and the potential for riches that stirred this debate is found in "Oceans: Wild West Scramble for Control" in the July 29, 1974 issue of *Time* magazine (pp. 51-54).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Drama of the Oceans by Elisabeth Mann Borgese. This strikingly illustrated account by a founder of the International Ocean Institute covers such topics as marine archeology, ocean architecture, the ecological crisis, seafloor spreading and continental drift, and ocean warfare.

The Ocean World of Jacques Cousteau by Jacques Yves Cousteau. In a series of beautifully illustrated volumes on a variety of topics, the author introduces the many marvels of the ocean world.

Challenge of the Seven Seas by Claiborne Pell with Harold Leland Goodwin. In this book, the senator from Rhode Island encourages Americans "to begin to think of the sea as a friendly and profitable environment in which to work," so that we can "begin the true exploitation of this greatest resource."

Suggested Discussion Questions

How have the oceans shaped the development of our nation and our national character? How does this influence compare to that of land frontiers and, more recently, the frontier of outer space?

How have our uses of the oceans changed in the more than 450 years since colonists first came to America? What factors have determined our varied uses of the sea?

What, in your opinion, are the greatest future challenges posed by the sea? Will the American "frontier spirit" prevail to meet these challenges?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV in alphabetical order by course article. For aid in locating groups or institutions that may provide speakers and other resources, please see Section III.

The Many Faces of the Sea

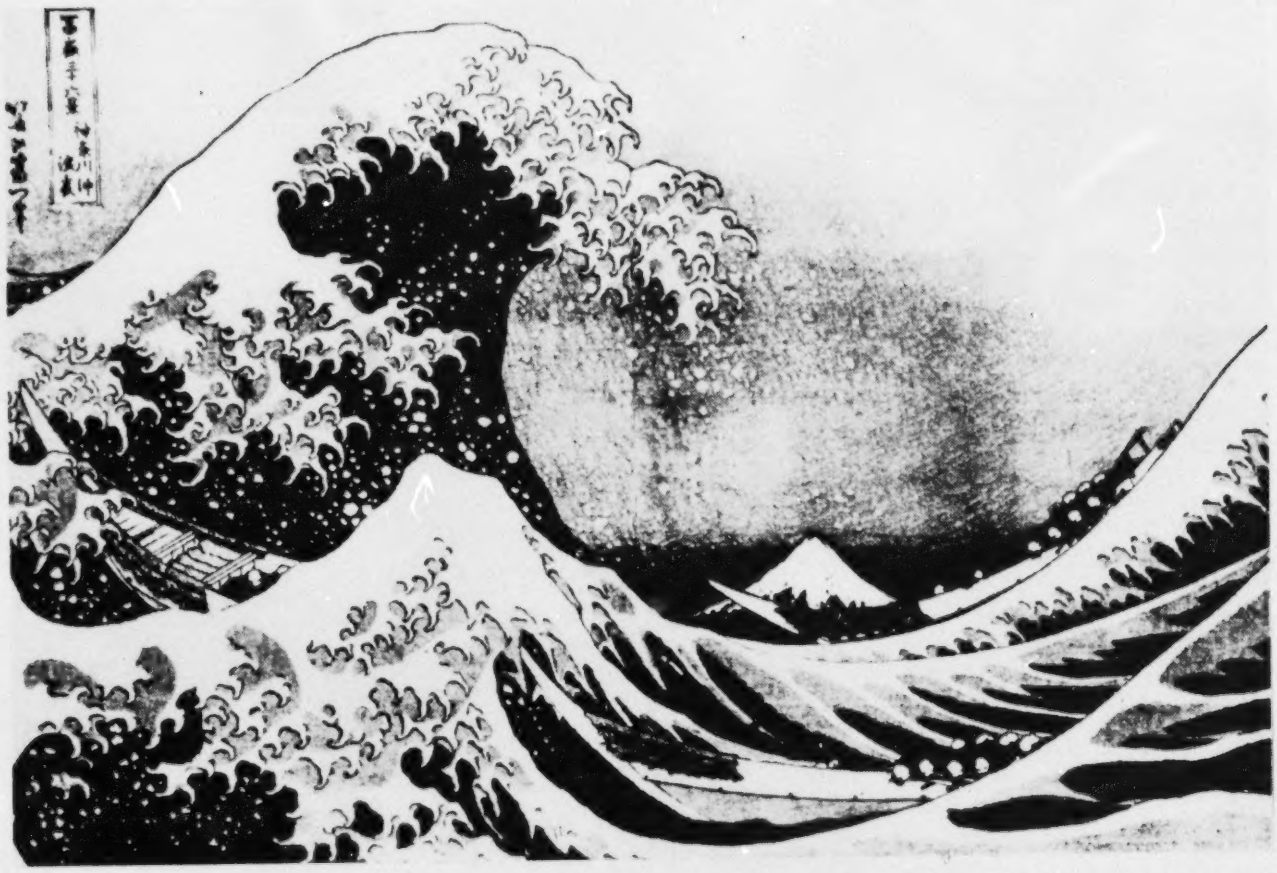
Since the beginning of time, the sea has served people of all civilizations who in turn have sought to unveil its mysteries. Explore these roles of the sea by first viewing *The Endless Sea*, a dramatic film that surveys the practical uses of the sea, recent scientific exploration of its dark depths, and misuses that threaten this vast frontier. Following the film, invite the coordinator of the Courses by Newspaper program at your local college or university to discuss the issues raised in the film and ways they will be explored in the remainder of the Courses by Newspaper series.

Links With the Sea

As course coordinator, H. William Menard states in his introductory article, "No nation has been so intimately linked to the sea throughout its history" as America, and there has been "none so negligent of that link when other frontiers beckoned." Invite a historian from your local high school, community college, or university to discuss these links and their impact on our nation's history and development. Members of the audience can be encouraged to comment on the relationship of their community and its residents to the sea.

The Bounded Main

It is generally agreed the growing international importance of the oceans could be a source of conflict unless a means of governing them and their resources can be developed. For background on this issue, view *The Sixth Continent*, an overview of the science of oceanography in which experts Jacques Piccard, Scott Carpenter, and Wernher von Braun describe their concerns for the future of the deep as its potential contributions to civilization are realized. Then discuss with a professor of law or of international relations from a local college or university the possible legal solutions to some of the issues raised in the film and the political and economic barriers to such solutions.



Katsushika Hokusai, *The Crest of the Great Wave off Kanagawa*, circa 1829. One of a series of thirty-six views of Mt. Fuji, this Japanese print has immortalized the "tsunami," towering waves caused by underwater earthquakes or volcanic eruptions.

Unit Two: Literature and Art

2. WRITERS AT SEA

"Poems about the sea—of these there will surely never be an end so long as there are poets and the sea. But the day of the great sea stories may well be over, at least for a long time, at least in the English-speaking world."

— George Elliott

Background

From the Courses by Newspaper Reader

OCEANS: OUR CONTINUING FRONTIER

Sir Patrick Spens. This ballad describing a seafaring adventure was popular in the fifteenth century.

Psalm 107. Man's connections to the sea and, through it, to God are described in this moving verse.

Ariel's Song. In this lyrical verse from *The Tempest*, William Shakespeare depicts man's relationship to the sea.

Dover Beach. Victorian poet Matthew Arnold uses the sea in this poem as an image of a joyless, uncertain world.

Sea Fever. The eternal lure of the sea is captured in this poem by John Masefield, a poet laureate of England.

On This Island. Prize-winning poet W. H. Auden invites a "full view" of the sea's various sights and sounds.

The Day the Tide. The meaning of the sea in the lives of people today is evoked by contemporary poet Philip Booth.

Dauber. In this narrative poem, John Masefield portrays the sea as a cruel test of manhood.

The Open Boat. In this short story, author Stephen Crane captures man's powerlessness against the brute force of the sea.

Moby-Dick. The sea becomes a multifaceted symbol in this excerpt from the literary classic by Herman Melville.

From Popular Periodicals

The influence of one great American author on the creator of *Moby-Dick* is recalled in "Melville Meets Haw-Thorne" by Professor John A. Philips in the December 1975 issue of *American Heritage* (pp. 16-21+).

Hannah Arendt recalls the life and writing of W. H. Auden, a poet known for his love of the sea, in "Reflections" in the January 20, 1975 issue of *The New Yorker* (pp. 39-40+).

Books to Review

From the bibliography of the STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Salt Water Ballads by John Masefield. This collection of poems by the former poet laureate of England celebrates

his intimate and affectionate knowledge of the sea.

World's Great Tales of the Sea and *Great Sea Stories of Modern Times* edited by William McFee. These two collections feature stories by Jack London, Rudyard Kipling, and Somerset Maugham.

Moby-Dick by Herman Melville. This classic of American literature elevates an exciting sea adventure to a powerful comment on the nature of good and evil in humanity.

Suggested Discussion Questions

In much fiction, the sea is used as a symbol. What are some of the common ideas or philosophies represented by the sea? What, if anything, has replaced the sea as a symbol of similar ideas and philosophies today?

How is the impact of the sea on human history reflected in the literature of the sea?

In reading the many reports of sea voyages, battles, and explorations, it is evident that many people who went to sea were compelled to record their experiences. What explanation of this phenomenon is possible?

According to Courses by Newspaper author George Elliott, in the literature of the sea "it is the direct, deep, essential connection [with the sea] that matters most" to readers. Why? What are they seeking?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV. Groups or institutions that may provide speakers and other resources are found in Section III.

A Monstrous Enemy

One depiction of the sea in literature is as a fierce enemy bent on destroying human intruders. This theme is dramatized in *The Old Man and the Sea*, a vivid film of Ernest Hemingway's powerful account of one man's struggle to conquer the ever-challenging sea. View this film with your group and then lead a discussion of the view presented of the sea's relationship to humanity. A literature teacher from a local high school, community college, or university might serve as discussion moderator and commentator.

Poet Laureate of the Sea

More than any other recent poets, England's John Masefield successfully captured the many faces of the sea and sailors. Sample the most famous of his intimate and affectionate sea poems by playing Caedmon recording TC 1147, *John Masefield Reading Sea-fever, Cargoes and Other Poems*, available in many libraries as well as large record stores. Invite a local teacher of English literature to provide background on the life and times of the poet and to lead a discussion of the recorded poems.

Writing About the Sea

Unquestionably, the sea has figured prominently in the literature of many civilizations from antiquity to the present. Convene a panel to discuss the various uses of the sea by writers of different nationalities and the reasons many of these themes have persisted throughout history. Panelists could include a teacher of history or a local maritime historian, a teacher of literature or a local librarian, a local psychologist or social scientist, and, for a perspective on the use of sea themes in the literature of various countries, teachers who specialize in literature and languages of France, Spain, and Italy, for example.

Adventure at Sea

Much of the best-loved literature of the sea consists of tales of high adventure that pit ships and their crews against the wiles of the sea and its inhabitants. Bring two of these tales to life for your group by playing "The Rime of the Ancient Mariner," interpreted by Sir Ralph Richardson on Caedmon recording TC 1092, *The Poetry of Coleridge*, and excerpts from *Moby-Dick*, read by Robert H. Chapman on Spoken Arts recording 850, *Moby-Dick*. (Both recordings may be available in community or university libraries or may be ordered through a local record store.) Then lead a discussion to compare the themes and images of the sea conveyed in these classic works.

3. HORRORS OF THE DEEP

"Alas, Nessie [the Loch Ness Monster] is still only as tangible as UFOs. And the few good old sea monsters we thought we had are dwindling in reputation and numbers as divers add new dimensions to modern marine biology."

—Eugenie Clark

Background

From the Courses by Newspaper Reader

OCEANS: OUR CONTINUING FRONTIER

The Poulps. In this selection from his classic science-fiction tale *Twenty Thousand Leagues Under the Sea*, author Jules Verne describes an incredible monster of the deep.

Kraken. Natural scientist Frank Lane relates how the existence of the kraken, or giant squid, was established.

Sharkproof! Experiments attempting to develop an effective repellent against marauding sharks are chronicled by scientist Eugenie Clark.

Shark Attack Against Man. The findings of a survey by zoologist H. David Baldridge reveal startling similarities among the victims of shark attacks.

From Popular Periodicals

One of the most commonly described sea "monsters," the octopus, is unmasked by scientist George D. Ruggieri and writer Norman D. Rosenberg in "Octopus: Cowardly Lion of the Sea" in the July 1974 issue of *Oceans* (pp. 50–55).

Conservationist David O. Hill relates the life cycle and dangers faced by one of the real monsters of the sea—the whale—in "Vanishing Giants" in the January 1975 issue of *Audubon* (pp. 56–88+). This article, which appears in condensed version in the August 1975 issue of *Reader's Digest* (pp. 74–80), is heavily illustrated with paintings by Richard Ellis.

Has the Loch Ness monster's existence been proven by recent photographs? Draw your own conclusions from a brief, illustrated report that summarizes the evidence collected so far in "The Real Nessie?" in the March 1976 issue of *International Wildlife* (pp. 38–39).

What is known and what remains to be learned about the numerous species of man-eating sharks is chronicled by free-lance writer Elizabeth Keiffer in "Sharks" in the May 4, 1975 issue of *The New York Times Magazine* (pp. 32–38).

The moray eel, "vicious as a barracuda, cunning as a tiger shark, and tenacious as a giant squid," is described

in "Moray Eel: Deadly Recluse" in the December 1974 issue of *Science Digest* (pp. 66-68).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Lady and the Sharks by Eugenie Clark. A professor of zoology relates her studies of sharks while she was head of the Cape Haze Marine Laboratory in Sarasota, Florida.

A Pictorial History of Sea Monsters by James B. Sweeney. The fact and fiction surrounding sea monsters is chronicled from ancient times to the present.

Suggested Discussion Questions

What are the possible explanations for the legends of incredible numbers and varieties of monsters supposedly lurking in the sea?

How has the unmasking or debunking of many of these legendary creatures affected our view of the sea?

Why, in recent months, has the shark, a dangerous yet unmysterious predator, emerged as the "pop" monster of the sea?

As long as the oceans remain a frontier, will they continue to be populated, in the public's mind, with fearful creatures and forces? If so, what do these popular imaginings imply about our modern society?

What steps can be taken to prevent the senseless slaughter of these so-called monsters? Can any steps be taken to remove the fearful images of sea monsters that persist in the public's mind?

Program Suggestions and Resources

Fear of the Deep

Ever since human beings ventured into the sea, stories of monstrous creatures and forces have frightened both sailors and landlubbers. Invite a local marine biologist or a folklorist to relate some of these tales and the modern explanations for them. Encourage your audience to share their fears about the sea and the origins of these fears.

Jaws

The one creature that reigns as the most feared sea monster of present times is the shark. Explore the fact and fiction surroundng this predator by first viewing *Sharks: Terror, Death, Truth*, a film that attempts to analyze "shark fever." Following the film, invite a local psychologist or a social science teacher to discuss the issues raised in the film about the rise of this recent popular mania.

Leviathan

Threatened with extinction as a result of world-wide slaughter for its oil, the whale recently has been revealed as one of the most intelligent, expressive, and responsive of the ocean's denizens. To get better acquainted with this "monster," view *We Call Them Killers*, a film that captures the remarkable responses of two captive killer whales to playful tickling and music. Following the film, a local biologist or cetologist (a scientist who studies whales) can share additional findings as a result of whale research, and a representative of a local conservation group can describe the steps being taken to save the world's whale population.

Danger

Regardless of the light science has shed on the flora and fauna of the oceans, people who venture into the sea must still do so cautiously. If your community is near an ocean, invite a local marine biologist, diving or swimming instructor, or boating instructor to describe the ecosystem of your particular area, the dangerous sea creatures that dwell there, and steps that can be taken to avoid encounters with these animals and plants. To introduce the program, show *Undercurrents*, a brief, often humorous view of the strange world beneath the sea.

4. AMERICAN IMAGERY AND VISIONS OF THE SEA

"The voyage and the frontier persist as a vital experience today in American art as in American life. For some it is a voyage inward to the self, for others a journey outward to the oceans of space."

— John Wilmerding

Background

From the Courses by Newspaper Reader OCEANS: OUR CONTINUING FRONTIER

Seascape and the American Imagination. Roger B. Stein, who assembled an exhibition of American marine painting for the Whitney Museum of American Art, describes the relationship of seascape artists to the sea.

The Art of the Seaman. Crafts, such as scrimshaw, painted sea chests, and model ships, and their seagoing craftsmen are depicted by Gerhard Timmermann and Helen L. Winslow.

Visions of the Sea. Reproductions of paintings by artists such as Winslow Homer and Alexander Calder illustrate ever-changing impressions of the oceans. Also reproduced are examples of scrimshaw, the once flourishing folk art of carving on whalebone and whale teeth.

From Popular Periodicals

The paintings of English artist Leslie Wilcox, whose specialty was American clippers, "the forefront of the merchantmen of their time," are reproduced in "The Seafaring Tradition" in the August 1973 issue of *American Heritage* (pp. 18-27).

Doctoral student Nancy Hellar reviews the life and works of sea artist Winslow Homer in "Winslow Homer: The Great American Coast" in the January 1976 issue of *American Artist* (pp. 34-39+).

In an article featuring four beautifully reproduced photos, Herbert Keppler explores the special skills required for underwater photography in "The Luminous Water World of Douglas Faulkner" in the April 1975 issue of *Modern Photography* (pp. 100-105). For more examples of Mr. Faulkner's superb photography of sea flora and fauna, see "Life in a Cold Ocean" in the January 1974 issue of *Audubon* magazine (pp. 18-49).

A conversation with artist Walter W. Bollendonk, edited by author and artist Charles Movalli, gives insights into the technical side of marine painting. See the December 1975 issue of *American Artist* (pp. 30-35+).

In a review of a London exhibit of J. M. W. Turner found in the Februry 8, 1975 issue of *Saturday Review* (pp. 34-35), critic Katherine Kuh briefly summarizes the career and impact of the well-known English marine painter.

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Winslow Homer at Prout's Neck by Philip C. Beam. This book focuses on works Homer produced during the later part of his life (1883–1910).

Marine Painting in England, 1700–1900 by David Cordingly. Featuring a general discussion of the period, this book includes biographies of individual artists and reproductions of their works

Suggested Discussion Questions

Which of the many views of the sea found in the literature of the sea also have been interpreted in marine painting? Are the views of the sea found in the literature of a particular era similar to or different from those expressed in the marine painting of the same era?

In what ways does marine painting reflect the times of the artist? The history of a country? The art movements of particular eras?

What does contemporary marine painting reveal about modern society's view of the sea? Does this contemporary view correspond to the common point of view at any other time in our nation's history?

Will marine painting continue to thrive as an art form? What impact do you expect our growing knowledge of the sea to have on marine artists and their works?

Program Suggestions and Resources

Capturing Moods

Artists have frequently captured reflections of their era's moods in the many faces of the sea. If there is an art museum in your area, invite its art historian or curator to discuss with your group the ways the history of marine painting corresponds to the history of nations. Members can be encouraged to speculate on the current directions marine painting is taking. If there is no museum in the area, invite an art teacher or historian from a local high school, community college, or university.

Illuminating the Sea

One outstanding marine painter whose distinctive, easily recognized works explore the moods of the sea with light is J. M. W. Turner. To learn more about Turner, begin by viewing *Turner*, an unnarrated film that displays a great number of his most well-known paintings. Following the film, a local art teacher, historian, or artist can be asked to comment on Turner's interpretations and their place in the art of his time.

In Three Media

Samuel Taylor Coleridge's sweeping poem, "The Rime of the Ancient Mariner," which portrays man's struggle with the sea, has been interpreted by the distinguished nineteenth-century wood engraver and illustrator Gustave Dore'. Both Dore''s and Coleridge's works have been interpreted in the film *The Rime of the Ancient Mariner*. View this film and then lead a discussion of the various images of the sea depicted and their interpretation in the three media—words, illustrations, and film.

Nature's Expression

Much of the art of the sea—the fantastic colorings and shapes of its plant and animal life—has been recorded by underwater photographers. For a fascinating glimpse of life below the ocean's waves and for insights into a complex art form, invite a local underwater photographer to share his portfolio with your group. Often a local photography club can help you locate a photographer who specializes in this field.

Deep Sea Drilling Project, Scripps Institution of Oceanography

The Glomar Challenger. A modern oceanographic ship, the deep-sea drilling vessel *Glomar Challenger* is drilling and coring for ocean sediment in all oceans of the world.

Unit Three: Science and Myth

5. EXPLORATION OF THE SEA

"It is an exaggeration to say that nothing was done in the deep sea between the *Challenger* expedition and World War II . . .. However, the continuous, well-supported effort that was needed to make a real impression on the immense technical and conceptual problems was lacking. The change came from the experience of the war."

— Sir Edward Bullard

Background

From the Courses by Newspaper Reader OCEANS: OUR CONTINUING FRONTIER

The Voyage of the H.M.S. Challenger. This exchange of correspondence between the British Admiralty and the Royal Society of London led to the three-and-one-half-year *Challenger* expedition, frequently cited as the beginning of the era of modern oceanography. Also reprinted is a humorous poem from *Punch* magazine, "The Challenger Her Challenge," which reveals the popular view of the expedition.

Anatomy of an Expedition. In his description of a modern oceanographic expedition, Professor H. William Menard shows that many of the problems faced by modern

researchers are similar to those faced by the pioneer oceanographers on the *Challenger* voyage.

Seven Miles Down. A history-making dive in a bathysphere to the deepest-known spot in the ocean is described by Jacques Piccard, a participant, and Robert S. Dietz, an oceanographer.

From Popular Periodicals

Scientist Robert D. Ballard recounts his spine-tingling dive to the bottom of the Atlantic in the bathysphere *Alvin* as part of the Project FAMOUS expedition in "Project FAMOUS: Dive into the Great Rift" in the May 1975 issue of *National Geographic* (pp. 604–615). In the same issue (pp. 586–603), the chief scientist for Project FAMOUS, Dr. J. R. Heirtzler, describes the goals and outcomes of this modern exploration of the ocean floor.

The many problems encountered on an oceanographic expedition despite years of careful planning are evident in "Floor of the Mid-Atlantic Rift," a report on the preparations and execution of the Project FAMOUS expedition by scientists J. W. Heirtzler and W. B. Bryan in the August 1975 issue of *Scientific American* (pp. 79–90). Offprints of this article can be ordered for $.30 each from W. H. Freeman and Company, 660 Market Street, San Francisco, CA 94104.

Senior editor George Reiger recounts the recent rapid advance of underwater exploration through the use of minisubs and even underwater habitats in "Down to the Sea in Mini Labs" in the July 1974 issue of *International Wildlife* (pp. 36–41).

Oceanographer Gilbert L. Voss describes the findings of a sea research project that retraces the route of the historic *Challenger* expedition in "On the Track of the Challenger" in the January 1976 issue of *Sea Frontiers* (pp. 35–43).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Oceans by Karl K. Turekian. This brief guide to the oceans emphasizes the geophysics and geochemistry of the marine environment.

The Great Ocean Business by Brenda Horsfield and Peter Bennet Stone. Recent developments in marine geology, including evidence of sea-floor spreading and continental formation, are viewed against the political and economic considerations governing United States ocean policy.

Suggested Discussion Questions

The systematic exploration of the oceans is a recent phenomenon. What combination of factors explains why the science of oceanography did not flourish earlier? What combination of factors have made its recent advances possible?

How should scientific surveys of the sea be funded? How can the return on an investment in scientific research be measured?

If research is sponsored by a government, a corporation, or an international organization, for example, are the findings of that research the property of the sponsor? If not, how should research results, many of which have great economic or strategic significance, be treated? Be publicized?

What in your opinion should be the focus of future exploration of the oceans?

What role, if any, should scientists who study the oceans take in the debate over public policy governing the sea?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV. Groups or institutions that may provide speakers and other resources can be found in Section III.

A Catalyst for Research

Perhaps no other governmental organization has contributed more to advance the ocean sciences than the United States Navy. To learn more about the role of the navy in ocean exploration, begin by viewing *Assault on the Unknown*, a film produced by the navy to show the variety of equipment used in underwater exploration. Then invite the public information officer of a nearby naval district or a representative of the Navy League to discuss current research undertaken by this branch of the military service.

Barriers

In the course of efforts to explore the ocean, explorers and scientists have struggled with great success to overcome the barriers posed by this alien environment. One effort to construct and live in an undersea habitat is chronicled in the film *The World of Jacques-Yves Cousteau*. Show this film to your group and follow it with a panel discussion of the hazards of underwater research. Panelists could include marine scientists with a local university or with the United States Navy, a local diving instructor, and an engineer involved in offshore oil drilling.

Sea Grant

Not all of the barriers to ocean research are posed by the sea; in the past much ocean research has been stymied by a lack of funding. One program attempting to reverse this trend is the Federal Sea Grant Program. Invite a representative from this program to explain its purposes, funding procedures, and any cooperative efforts under way. A list of Sea Grant institutions can be found in Section III.

6. A NEW WORLD PICTURE

"The idea that the continents have moved apart is not news. It was urged most persuasively by Alfred Wegener, a German meteorologist, 60 years ago. What is new is that a study of the ocean floor has demonstrated that it really happened."

—Sir Edward Bullard

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Floor of the Sea. Author William Wertenbaker captures scientists at the Lamont-Doherty Geological Observatory in the act of a series of discoveries that lead to the widely accepted theory of plate tectonics.

Minerals and Plate Tectonics: A Conceptual Revolution. The implications of the theory of plate tectonics for the search for mineral resources, and eventually for the economy, are assessed by science writer Allen L. Hammond.

From Popular Periodicals

In a two-part series appearing in the January (pp.30–40) and February 1975 (pp. 38–47) issues of *The Smithsonian* magazine, writer Tom Alexander clearly explains the "elegant, all encompassing" theory of plate tectonics and insights this theory has unveiled about the past, present, and future of the earth. Reprints of this excellent series are available for $1 each (one reprint includes both articles) from *The Smithsonian*, 900 Jefferson Drive, S.W., Washington, D.C. 20560. Make checks payable to the Smithsonian Institution.

Professor A. Hallam of the University of Oxford recalls an early theory similar to plate tectonics proposed sixty years ago by a German scientist and initially dismissed by his contemporaries as heresy in "Alfred Wegener and the Hypothesis of Continental Drift" in the February 1975 issue of *Scientific American* (pp. 88–97).

The implications of plate tectonics on other areas of research are described in "Paleoceanography: Sea Floor Clues to Earlier Environments" by science writer Allen L. Hammond in the January 16, 1976 issue of *Science* (pp. 168–176+) and in "Plate Tectonics and a History of Life in the Oceans" by geologists James W. Valentine and Eldridge M. Moores in the April 1974 issue of *Scientific American* (pp. 80–89). Offprints of the Valentine-Moores article can be ordered for $.30 each from W. H. Freeman and Company, 660 Market Street, San Francisco, CA 94104.

Books to Review

Selections from the bibliography in the Course by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

A Revolution in the Earth Sciences: From Continental Drift to Plate Tectonics by A. Hallam. The historical background of Wegener's theory of continental drift as well as recent evidence of ocean-floor spreading are presented in this book.

Continents in Motion: The New Earth Debate by Walter Sullivan. In this excellent introduction to the subject of continental drift, the science editor of *The New York Times* chronicles the characters and clues that led to a new view of the earth.

Suggested Discussion Questions

Summarize the contributions of the science of oceanography to the new theory of the earth's structure.

What do the history of these discoveries and the piecing together of the new theory reveal about the nature of scientific discovery?

How would you compare the discovery of sea-floor spreading and continental drift to other scientific discoveries throughout modern history?

What factors prevented the acceptance of a remarkably similar theory proposed by Alfred Wegener more than sixty years ago? Are there incidents similar to this one in other disciplines?

Program Suggestions and Resources

The Continents Adrift

One of the most exciting scientific theories recently proposed is plate tectonics, a theory developed largely as a result of ocean research. Invite a local teacher of geology or natural science to outline the development of this theory, its basic components and its implications. As part of this program, you might want to show *Fire Under the Sea: The Origin of Pillow Lava*, a film that documents the underwater lava flows described in the plate tectonics theory.

A Light Into the Past

Both ocean research and the now widely accepted idea of continental drift have shed light not only on the earth's origins but also on the history of its climate and plant and animal life. Invite a marine scientist doing research in these areas, a biology teacher at a local high school, community college, or university, or a local meteorologist to comment on the revelations derived from this research and theory.

7. SCIENCE AND ANCIENT SEA STORIES

"Long before Rome was built, common sailors talked of crossing the wide ocean beyond the gates of Hercules and of the great civilization of Atlantis that perished beneath the sea in a single night . . . Tall tales? Ah yes, but modern nautical archeology and historical research have shown that all of those wild stories are true!"

—Willard Bascom

Background

From the Courses by Newspaper Reader OCEANS: OUR CONTINUING FRONTIER

The Search for Atlantis. Classics professor J. V. Luce convincingly argues that the civilization of the so-called lost continent of Atlantis was really that on the Minoan island of Crete.

Deep Water, Ancient Ships. Serendipity still plays an important role in the increasingly exact science of marine archeology, as oceanographer Willard Bascom demonstrates in this selection.

Geology and the Flood. Geologist Paul C. Tychsen analyzes some of the geologic evidence advanced to confirm or deny the existence of the Biblical story of Noah and the flood.

From Popular Periodicals

What are the possible explanations for the many ships and planes that have disappeared in the so-called Bermuda Triangle? James Stewart-Gordon offers some in "What's the Truth About the Bermuda Triangle?" in the July 1975 issue of *Reader's Digest* (pp. 75–79).

Scientist John G. Newton recounts the excitement and methods used in finding the wreckage of the Civil War iron-clad ship, the *Monitor*, in "How We Found the Monitor" in the January 1975 issue of *National Geographic* (pp. 48–61).

A study of sea-level changes that has already documented a thirteen-foot rise in the last 2,000 years is explained by scientist Alan P. Carr in "Ever-changing Sea Level" in the March 1974 issue of *Sea Frontiers* (pp. 77–83).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Shipwrecks and Archaeology: The Unharvested Sea by Peter Throckmorton. A marine archeologist descibes what happens to ships and their contents after centuries under the sea and reports on his own investigations in this field of study.

Before Columbus: Links Between the Old World and Ancient America by Cyrus Gordon. The author, who has written many books on the ancient civilzations of the Near East, examines a variety of evidence to support his conclusion that the Atlantic was crossed long before the Vikings.

Suggested Discussion Questions

Legends of the sea still captivate much of the public even though scientific explanations for most of them have been advanced. How can this persistent public fascination be explained?

How has the science of oceanography contributed to an understanding of the origin of such legends as the lost continent of Atlantis, the Biblical flood, the story of Jason's quest for the golden fleece? What questions, if any, remain unanswered?

The Bermuda Triangle is an example of a modern sea legend. What explanations have been offered to explain this phenomenon?

Program Suggestions and Resources

Found: The Lost Continent

Has the lost continent of Atlantis been found in the remains of a highly advanced civilization on Crete? Let your members weigh the evidence presented in *Atlantis*, a documentary that compares the civilization destroyed by a Bronze Age explosion to that described by Plato. Following the film, encourage group members to discuss the evidence offered. A local archeologist could be asked to serve as discussion leader.

A Great Flood

An account of a great flood can be found among the histories and legends of almost every civilization. As a result of modern ocean research, explanations of this coincidence have been offered. Invite a local geologist or a marine scientist active in this area of research to share the most recent findings with your group. A local minister, priest, or rabbi could also be invited to comment on the response of Biblical scholars to these scientific explanations.

The Treacherous Triangle

In addition to its fascination with *Jaws*, the public has avidly followed the tales of lost ships and planes in the so-called Bermuda Triangle. Invite a local meteorologist or marine scientist to review some of the incidents in that area of the Atlantic and possible explanations of those occurrences. Instructors at local sailing and flying schools also could be invited to discuss precautions advised when sailing or flying in this dangerous area.

UPI

North Sea Giant. The three 310-foot-high concrete supporting shafts, or pylons, of "Beryl A," the world's first concrete oil drilling and production platform, tower above Gants Fjord near Stavenger, Norway.

Unit Four: Marine Resources

8. MINERAL RESOURCES OF THE OCEAN

"The history of petroleum and hard minerals development on land has always involved high risk and great controversy. As such activities move into the marine environment, those characteristics are likely to be magnified, not reduced."

—Don E. Kash

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Riches in Davy Jones's Locker. This selection from *Newsweek* magazine gives an overview of the oceans' mineral resources and the debate over control of these potential riches.

Taking Oil Off the Shelf. Robert Bendiner, a member of *The New York Times* editorial board, assesses the environmental impact of offshore drilling and the wisdom of current United States leasing policies.

The Outer Continental Shelf: Energy Needs vs. Environment. Science writer Luther J. Carter argues that complicated leasing procedures have slowed exploration for oil in the deeper waters off America's coasts.

Mining the Sea: Manganese Nodules. The problems of technology and international law posed by the race to recover valuable mineral deposits from the ocean floor are discussed by science writer Allen L. Hammond.

Deep-Ocean Mining. Retired vice-president of International Nickel Company Frank L. LaQue counters the optimistic belief that revenues shared from deep-ocean mining can reduce the gap between developed and developing nations.

From Popular Periodicals

The potential of the oceans' resources to help meet mankind's needs for food and energy have been greatly exaggerated, argues author Wesley Marx in "Oceans are Vastly Overrated as a Source of Food and Fuel" in the June 1974 issue of *The Smithsonian* (pp. 26–35).

Complex, expensive, and time-consuming efforts to exploit offshore oil reserves are described in "Worldwide Search for Oil" in the February 3, 1975 issue of *Business Week* (pp. 38–44).

Offshore drilling in the frigid Arctic in an attempt to exploit suspected oil lodes poses immense potential risk to the environment, according to zoology and forestry professor Douglas H. Pimlott in "The Arctic Offshore Gamble" in the Autumn 1974 issue of *Living Wilderness* (pp. 16–25).

Hawaii's deputy marine affairs coordinator, Howard Pennington, provides an overview on ocean nodules—what's in them, how they will be mined, and who will own them—in the March 1976 issue of *Oceans* magazine (pp. 36–43). Also included in this special issue on marine resources are articles on seaweed farming, shellfish mariculture, the over-fished sockeye salmon, and the extraction of thermal power from the sea. For information on ordering back copies of this issue, see the listing for the Oceanic Society in Section III.

Staff writer Gary Soucie summarizes the various forms of ocean power—tides, winds, and currents—that can be and are being tapped to meet future energy needs in "Plugging in the Oceans for Future Energy Needs" in the September 1975 issue of *Audubon* magazine (pp. 115–122).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Mining in the Outer Continental Shelf and in the Deep Ocean by the Panel on Operational Safety in Marine Mining, Marine Board, Assembly of Engineering, National Research Council. This book is a comprehensive survey of hard mineral resources the technologies used to mine them, and the regulatory arrangements that apply to them.

Blowout: A Case Study of the Santa Barbara Oil Spill by Carol E. and John S. Steinhart. This study carefully assesses the effects of the massive oil spill off the coast of Santa Barbara.

Suggested Discussion Questions

The conflict between the nation's energy needs and needs to protect its environment surfaces again in the quest for offshore oil. Have the environmental dangers of offshore drilling been exaggerated? If so, how?

Is the current effort to tap offshore oil an untimely distraction from the more important quest for alternative sources of energy? Are these limited oil reserves worth the tremendous investment of funds and technology?

Is there an equitable division of the costs and benefits of offshore-oil development among the oil industry, local and state governments, and the federal government? Is it necessary to devise new methods of financing research and acquisition of energy sources?

What are the arguments for and against America's proceeding to mine the sea floor in the absence of an international law dividing this valuable resource?

In an increasingly interdependent world, can the United States hope to maintain its energy and mineral independence from other nations? What are the alternatives to an independent posture?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV. Groups or institutions that may provide speakers and other resources are found in Section III.

Energy Beneath the Sea

The search for and exploration of offshore oil is expensive, risky, slow, and complex. For background on this effort and its potential contribution to meeting America's energy needs, invite a representative of your state's petroleum council to discuss the oil industry's activities off the nation's coast. Prior to this discussion, show *Offshore*, a film that captures the round-the-clock efforts of an oil-rig crew to find oil beneath the sea.

From Tides, Currents, and Waves

Undersea oil deposits are only one source of energy that may be tapped from the oceans. Explore the potential of some alternative sources of energy by inviting a local science teacher, a marine scientist active in this area of research, a representative of the United States Navy, or a representaive of an environmental group to meet with your group. If there is a firm in your area active in the solar energy field, invite a representative to comment on the possibilities for extracting thermal energy from the seas.

Who Gets What?

A major dispute between the states and the federal government has erupted over the question of leasing offshore-

drilling sites. Convene a panel to discuss this controversy with your group. Panelists could include your local representative to the United States Congress, a representative of your state Petroleum Institute or a major oil company, your representative in state government, and a member of an environmental group.

9. CAN THE SEA FEED THE LAND?

"It is surprising to many people that we are probably already at least halfway to the maximum harvest of the sea for familiar kinds of seafood. The greatest increase in fishing during the last two generations has left few if any stocks of these resources unexploited, and many have been severely damaged."

—C. P. Idyll

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Living Chain. In this excerpt from her prize-winning book, *The Sea Around Us*, marine biologist Rachel Carson describes the interlocking food chain within the sea.

Food From the Sea. Although they cite many marine stocks that are yet to be fully exploited as sources of protein, marine biologists C. P. Idyll and Hiroshi Kasahara offer a pessimistic assessment that the sea alone can solve the problems of feeding a hungry world.

Farming the Seas: The Blue Revolution. Elisabeth Mann Borgese, a founder of the International Ocean Institute, urges the application of scientific methods to aquaculture, which could lead to a Blue Revolution, similar to the Green Revolution in agriculture.

From Popular Periodicals

The rapid dwindling of herring fisheries off England's shores is explained by author Alastair Reid in "Reporter at Large: Herring Fishing off Mallaig" in the December 22, 1975 issue of *The New Yorker* (pp. 44–46+).

The Maine lobster and the Pacific salmon, both dangerously over-fished in recent years, are the bounty in two yet-to-be-resolved disputes over fishing rights. *New Yorker* staff writer Daniel J. Chasan summarizes the issues in the salmon fishing dispute in "Salmon: Bitter Fruit of the Pacific" in the November 1975 issue of *Audubon* magazine (pp. 8–23). For background on the Maine lobster "war," see "The Great Maine Lobster War" by *Audubon* staff writer Gary Soucie in the May 1974 issue of *Oceans* magazine (pp. 66–68).

Patti Hagan, a staff member of *The New Yorker*, takes an in-depth look at krill, an abundant crustacean high in protein now being developed as food for humanity, in "Singular Krill" in the March 9, 1975 issue of *The New York Times Magazine* (pp. 40+).

Marine biologist and United Nations advisor C. P. Idyll describes an attempt to develop a fishing industry in the Caribbean in "United Nations Fishes the Caribbean" in the May 1974 issue of *Sea Frontiers* (pp. 158–171).

The dilemma faced by Law of the Sea delegates to protect the fishing industry and the many already dangerously depleted fishing stocks is summarized by staff writer Luther J. Carter in "Law of the Sea: Fisheries Plight Poses Dilemma for the United States" in the July 26, 1974 issue of *Science* magazine (pp. 336–339).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Sea Against Hunger by C. P. Idyll. The present and future food resources of the sea are assessed in this nontechnical account.

Toward a National Ocean Policy: 1976 and Beyond by Robert C. Osgood, Ann L. Hollick, Charles S. Pearson, and James C. Orr. In this book, one of a series of reports of the Ocean Policy Project of the School of Advanced International Studies at the Johns Hopkins University, the various aspects of the new era of ocean politics are analyzed and related to United States ocean policy options.

Suggested Discussion Questions

On the sea, humanity still hunts its food rather than cultivates it. Is it possible and/or probable to reverse this state of affairs? How would it be done?

Why, even in the face of massive famine and starvation in many parts of the world, have food cultivation efforts centered on the land? Should the emphasis be placed on aquaculture instead? Why?

Who is responsible for the decline in many of our most valuable fish stocks? How can these stocks be replenished? How can the costs of these replenishing efforts be divided?

Conflicts over the division of the oceans fishing stocks are national as well as international. What are the different points of view expressed by interest groups in the United States involved in this controversy? What are the international divisions and how are they similar to or different from international divisions on other policy questions?

What will be the impact of the so-called economic zones being enacted into law by various nations? Evaluate the United States' decision to legislate a 200-mile economic zone. In light of current international activities in this area, were any options available to the United States?

Program Suggestions and Resources

Farming the Sea

If humanity is to increase its harvest from the sea, it is generally agreed that added emphasis must be placed on aquaculture. Weigh the potential contributions of efforts to farm the sea by first viewing *Down to the Sea*, a film that provides an overview of fishing, fish management, and aquaculture. Following the film, invite a marine scientist active in this area of research or a representative of a state or federal agency responsible for marine fisheries development to lead a group discussion to assess the future of aquaculture.

Over-fishing

As a result of competitive fishing by nations in certain areas of the sea, some valuable fish stocks such as herring and salmon are seriously depleted. Explore in a panel discussion the causes of this over-fishing, efforts to compensate for it, and steps being taken to prevent a recurrence. Panelists could include representatives of a fisher-

men's organization and a local environmental group, a state or federal conservation official, and a marine scientist or local biology teacher.

Two-Hundred-Mile Limit

The fishing industry certainly will be affected by the recently enacted legislation establishing a 200-mile economic zone, a band of coastal water surrounding our shores. To assess the impact of this change, invite an industry representative, a spokesperson for a fishermen's association, and a professor of international law from a nearby law school to discuss the issue and answer questions posed by your group. Your representative or senator in the United States Congress also can be asked to attend and to explain his or her vote on recently passed legislation creating a 200-mile economic zone for the United States.

10. POLLUTION: IS THE SEA DYING?

"The patient has symptoms of illness, but this is not a dread, incurable disease. A prescription for recovery and a long and healthy life are well known, but like a child the ocean cannot treat itself. It is up to us, the human race, to supply the cure if we but have the will and the patience to do so."

—Bostwick H. Ketchum

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Very Deep Did Rot. This description of a dying sea was written more than 175 years ago by English poet Samuel Taylor Coleridge.

How to Kill an Ocean. Ocean pollution can be expected to increase in the years ahead, according to the findings of famous voyager Thor Heyerdahl.

Netting Oil. Oil pollution in the Sargasso Sea area of the North Atlantic is described by scientist Max Blumer of the Woods Hole Oceanographic Institution.

A Realistic Look at Ocean Pollution. Bostwick Ketchum, associate director of the Woods Hole Oceanographic Institution, weighs the diverse factors involved in the complex problem of marine pollution.

Oceanic Oil Pollution. The former director of the Scripps Institution of Oceanography, Roger Revelle, and others analyze the extent and character of oil pollution and suggest possible courses of action to control the problem.

From Popular Periodicals

Author T. H. Watkins recounts his personal experience in cleaning up an oil spill in the San Francisco Bay in "The Day the Birds Wept: 1971 San Francisco Bay Oil Slicks" in the January 1976 issue of *Audubon* magazine (pp. 16–21).

The controversy surrounding the dumping of sewage "sludge" in the ocean near New York City is captured by free-lance writer Tracy Kidder in "Sludge" in the April 1975 issue of *The Atlantic* (pp. 62–68+).

Attorney and biologist with the National Wild Life Federation Kenneth S. Kamlet calls for a halt to the recent proliferation of ocean dumping in "It's Time to Stop Killing the Ocean" in the April 1975 issue of *National Wildlife* (pp. 18–21).

Oceanographer Willard Bascom argues that waste disposal in the oceans, if thoughtfully controlled, poses no threat to marine life. See "Disposal of Waste in the Ocean" in the August 1974 issue of *Scientific American* (pp. 16–25).

Attempts to reduce the already serious pollution of the Baltic Sea are chronicled by free-lance writer Gene De Castro in "The Baltic: To Be or Not to Be" in the September 1974 issue of *Sea Frontiers* (pp. 269–273).

Robert J. McManus, an attorney with the Environmental Protection Agency, assesses the complicated terms of the most recent international treaty on vessel pollution in "New Treaty on Vessel Pollution" in the July 1974 issue of *Oceans* magazine (pp. 59–65).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Frail Ocean by W. Marx. This popular book reveals the threats to the ocean's environment posed by human activities and introduces some of the legal problems in marine management.

Impingement of Man on the Oceans edited by D. W. Hood. Pollutants and the physical and chemical processes influencing their distribution are the topics of this collection of papers by well-known scientists.

Suggested Discussion Questions

Pollution of the ocean is most severe in the coastal waters of the world. What combination of popular attitudes and public actions allowed this situation to develop to its present dangerous point? How have these attitudes and actions been altered in recent years?

What is necessary to reduce coastal water pollution besides the "will and patience" cited by Dr. Ketchum in his article? What factors can be expected to delay or hinder implementation of the steps cited above?

To what degree is pollution of the oceans an international problem? Must the problem be treated on an international scale for the treatment to succeed?

Does the problem of enforcement mitigate the effectiveness of any international law governing ocean pollution? In what ways can this problem be overcome?

In what ways is protection of the land and ocean environments intertwined? Has this relatedness been recognized in our national efforts to protect the land environment?

Program Suggestions and Resources

Offshore Dumping

Great expanses of the United States' coastal waters have been severely damaged by the refuse and sewage wastes disposed there. For background on this problem and steps being taken to remedy it, convene a panel to discuss "Offshore Pollution: A Threat to Everyone, Everywhere." Panelists could include a local sanitation engineer, a representative of your state's environmental protection agency, a marine scientist or biology teacher from a local high school, community college, or university, and a member of an environmental or oceanic group. As a prelude to the panel discussion, show *The Poisoned Sea*, a film that presents the effects of pollution on the complex ecosystem in the coastal waters off southern California.

Down to the Sea

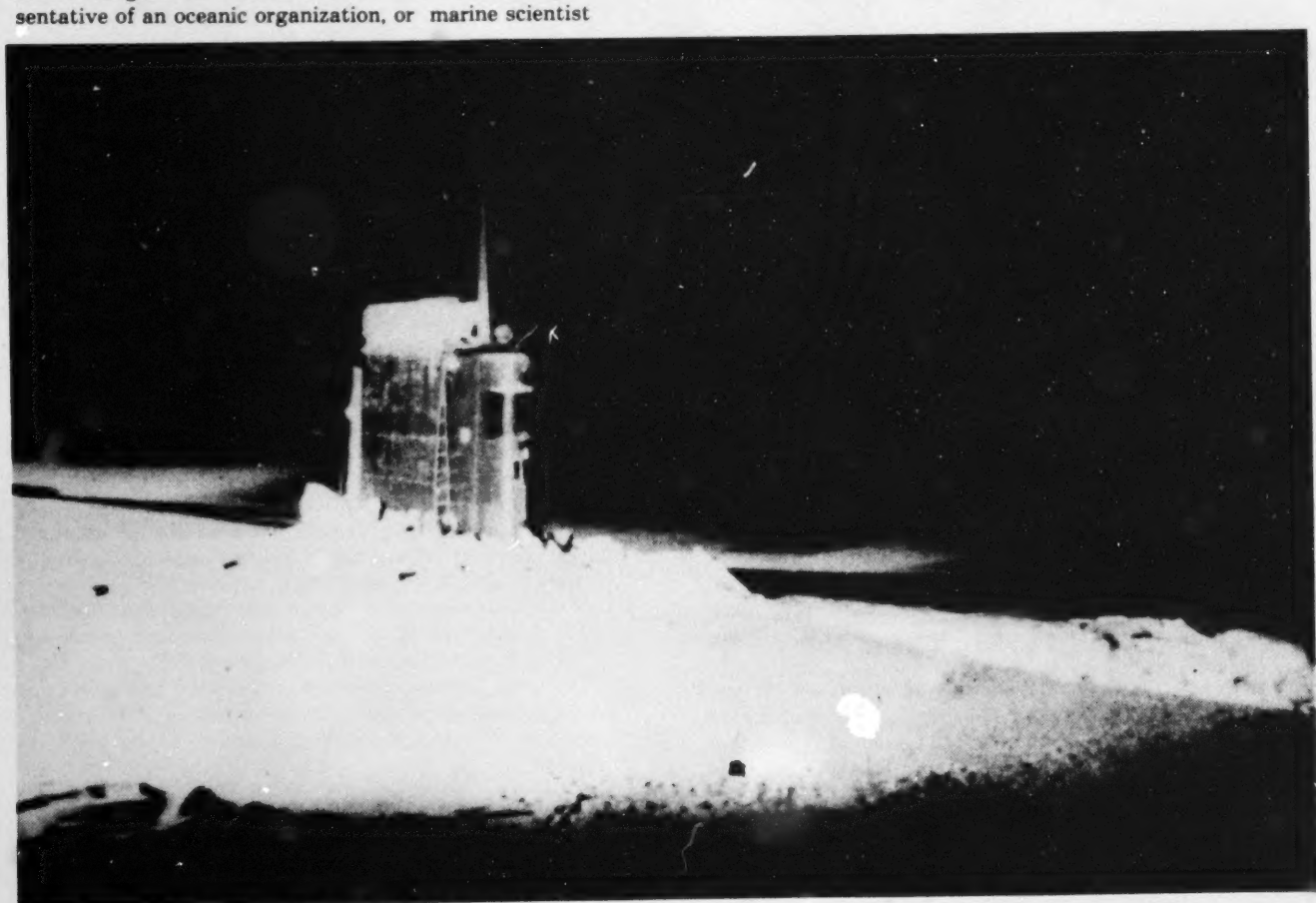
Some of the pollution of coastal waters is carried by the large rivers that empty their accumulated wastes and debris into the oceans. Explore this form of pollution by viewing *Oceans: The Silent Crisis*, a film that shows the effects on the Atlantic from pollution carried by the Mississippi River. Following the film, invite a member of an environmental group or a representative of your state's environmental protection agency to discuss steps being taken to lessen this form of pollution.

A World-wide Challenge

The fact that most deep-water ocean pollutants are carried by the atmosphere points to the need for an international program to preserve both the land and the ocean environments. Invite your representative to the United States Congress (or a member of his or her staff), a representative of an oceanic organization, or marine scientist active in this area of research to discuss the threat of pollution in the ocean's deep waters and steps that might be taken to combat this threat. Also invite a professor of international law or politics to comment on the prospects for an international agreement during the current United Nations Conference on the Law of the Sea.

The Threat of Oil

In his epic voyage across the Atlantic, adventurer Thor Heyerdahl reported visible evidence of oil pollution on forty-three of his fifty-seven days at sea. Just how serious a threat is oil pollution? What are its origins? How can its spread be halted? Convene a panel to discuss these questions. Panelists could include a representative of an oceanic organization, a representative of a state or national oil industry association, a marine scientist, and a representative of a shipper's organization.



U.S. Naval Electronics Laboratory Center

USS *Sargo* surfacing through ice at the North Pole.

Unit Five: Policy and Sea Power

11. LAW OF THE SEA

"Long regarded as the most stable and widely accepted part of international law . . . the law of the sea is now in the throes of rapid, perhaps convulsive, change. Unless this change can be brought about by widespread agreement, the prospect is for violence and confusion and diminished return from ocean resources."

—William T. Burke

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Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Common Heritage of Mankind. The principles set forth in this resolution adopted by the General Assembly of the United Nations in 1970 has become the basis for the continuing series of international conferences to establish a new law of the sea.

Diplomats at Sea. The positions of the delegates at the United Nations Conference on the Law of the Sea are reflections of international politics and even divisions within nations over particular issues, according to political scientists Seyom Brown and Larry L. Fabian of the Brookings Institution.

The Law of the Sea and World Order. Secretary of State Henry A. Kissinger outlines the United States' position in the current international debate on law of the sea.

Future Prospects for Law of the Sea. Arvid Pardo, who issued a call for a new law of the sea while he was the Maltese ambassador to the United Nations, expresses his concern that international tensions will be heightened by a law of the sea treaty that recognizes only the self-interests of coastal states.

Ocean Mining: Plans and Problems. Testifying before a Senate subcommittee, Marne A. Dubs, a representative of the American Mining Congress, warns the industry will not proceed to develop the technology for deep-sea mineral mining without protection from possible financial burdens arising from a new law of the sea and from interference by other countries.

Deep-sea Claim. In this letter, Deepsea Ventures, Inc. files the first mining claim for a section of the Pacific floor and requests government protection of its investment.

From Popular Periodicals

The 1974 meeting of the United Nations Conference on Law of the Sea accomplished "the reverse of their original good intentions," according to Tom Alexander in "Dead Ahead Toward a Bounded Main" in the October 1974 issue of *Fortune* magazine (pp. 128-131+).

For a concise summary of the divisive issues facing law of the sea delegates, see "Law of the Sea Conference Goes Aground" by environmentalist Philip W. Quigg in the October 19, 1974 issue of *Saturday Review/World* (pp. 33-34).

Because knowledge is power, scientific research is an issue in the law of the sea debate, explains John A. Knauss, provost for marine affairs at the University of Rhode Island, in "Marine Science and the 1974 Law of the Sea Conference" in the June 28, 1974 issue of *Science* (pp. 1335-1341).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Public Order of the Oceans by William T. Burke. This book is a comprehensive treatment of law of the sea.

Alternative Arrangements for Marine Fisheries: An Overview by Francis T. Christy Jr. The author argues that the freedom of fishing that has prevailed for centuries is leading to the waste of scarce resources and is no longer suitable for today's world. Asking "how fisheries can be managed so as to maximize the production of net benefits," he considers alternatives from strong coastal state control to control by an international body.

Suggested Discussion Questions

Why has the concept of freedom of the seas operated successfully in the past? Why now does it appear outmoded?

What role is nationalism playing in the decline of the freedom of the seas concept and in the United Nations Conference on Law of the Sea?

How do divisions at the United Nations Conference compare to divisions among countries on other international issues? Are new world alliances likely to emerge from the conference?

Assess the likelihood of an agreement on a new law of the sea and the likely consequences if no agreement is reached.

Are the goals of the Law of the Sea Conference realistic? Could, for instance, an international conference have successfully divided the world's land resources?

Why today is control of the oceans not simply decided by military might?

What law of the sea issues have created differences of opinion within the United States? In what ways are these positions representative of the divisions at the Law of the Sea Conference?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV. Groups or institutions that may provide speakers and other resources are found in Section III.

Scramble for the Sea

The discovery of valuable resources, now scarce on land, has resulted in a scramble among nations for control of the seas. For an overview of this controversy, view *Who Owns the Sea?*, a film that reviews the origins of the freedom of the seas concept and current developments that have rendered that concept obsolete. Following the film, invite your representatives in Congress or a State Department spokesperson to summarize the United States' position in the current United Nations Conference on Law of the Sea.

A World Divided

At the United Nations Conference on Law of the Sea, nations have formed some surprising alliances based largely on their definitions of their best interests. For an increased appreciation of the politics of an international conference and for insights into decisions that have presently stymied law of the sea delegates, invite a professor of political science to lead your group in role playing. One issue could be chosen, the group divided into opposing camps, and an attempt made to agree on a law governing this question.

Special Interests

Within the United States, there are many groups who have a stake in the outcome of the Law of the Sea Conference. Most notable are the fishing industry, marine scientists, environmentalists, the United States Navy, and

the oil industry. Invite representatives of each of these groups to discuss their concerns. A professor of political science or law can be invited to serve as commentator.

12. THE SEA: DEFENSIVE BARRIER OR INVASION PATH?

"... it is no longer true that a fleet at sea can only be attacked by another fleet at sea. In addition, today's aircraft have great range, offensive power, and presumably accurate targeting information. Air power thus makes not only the water contiguous to land extremely dangerous, but the open sea. On the other hand, the sea can now attack the heartland."

—Herman Kahn

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

World Sea Power: U.S. vs. U.S.S.R. Secretary of the Navy J. William Middendorf II reviews the traditional role of the United States Navy and outlines its current missions.

Sea Power in the 1970s. The role of the navy, radically altered by the advent of nuclear weapons, will become largely symbolic, argues Cornell University professor George H. Quester.

From Popular Periodicals

New York Times reporter John W. Finney examines the internal controversy over the future course of the United States Navy in light of the current debate on whether to add aircraft carriers to the force in "Dreadnaught or Dinosaur?" in the January 18, 1976 issue of *The New York Times Magazine* (pp. 6-7+).

In an interview on the eve of the United States Navy's 200th birthday, Chief of Naval Operations James L. Holloway III assesses the navy's strengths and weaknesses and suggests a future course in "Fresh Course for the Navy in a Changing World" in the October 20, 1975 issue of *U. S. News and World Report* (pp. 61-64).

The controversy surrounding the navy's plan to station its *Trident* submarine force near Bangor, Washington is analyzed by former aerospace engineer Robert C. Aldridge in "Puget Sound: Missile Target" in the February 1, 1975 issue of *The Nation* (pp. 111-114).

Three heavily illustrated articles in the January 1976 bicentennial issue of *Oceans* magazine recall important naval battles in United States history. See "War at Sea 1776" by writer Raymond Schuessler, "War at Sea 1862" by free-lance writer Irvin Oshkenazy, and "War at Sea 1941" by United States Coast Guard Lieutenant Commander Jim Hunt. For information on obtaining back copies of *Oceans*, see the listing for the Oceanic Society in Section III.

Although the Panama Canal is fading in economic and military importance, the negotiation of a new treaty that will govern its future operation is the subject of a great controversy, as writer Richard Hudson shows in "Storm Over the Canal" in the May 16, 1976 issue of *The New York Times Magazine* (pp. 18-20+).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Makers of Modern Strategy: Military Thought From Machiavelli to Hitler, edited by Edward M. Earle; Gordon A. Craig and Felix Gilbert, collaborators. In this collection of articles, distinguished authors comment on leading strategic thinkers from the sixteenth century to the beginning of World War II.

Sea Power in the 1970s, edited by George H. Quester. In this group of papers presented at the Conference on Problems of Naval Armaments in 1972, various aspects of the growing competition of the Soviet Union and the United States on the high seas are considered.

Suggested Discussion Questions

Has the navy fulfilled the role prescribed for it by Alfred Thayer Mahan? Have the other branches of the military contributed to fulfilling this role?

What conclusions can be drawn from the tests of United States sea power in both world wars?

Is Mahan's theory applicable in an age of nuclear warfare? Must it be modified or completely redefined?

What are the roles of the modern navy in the nuclear age? How can the navy be prepared to fulfill what you consider to be its primary mission?

What should be the relationship of the navy to the other military branches? Where the functions overlap, can the duplication of costly equipment and manpower be prevented?

Program Suggestions and Resources

Sea Power

The theory of sea power proposed by Alfred Thayer Mahan has been tested in both world wars. Assess his theory in light of those events by inviting a teacher of modern American history to lead a discussion with your group. Prior to the discussion it might be helpful to view *Victory at Sea*, a film culled from the popular television series that chronicled the navies' role in World War II.

Today's Navy

The role of the United States Navy is currently the subject of debate within the navy and in the halls of government. Convene a panel to present the various points of view in this debate. Panelists could include a representative of the navy, a member of the Navy League, a military historian, a specialist in international affairs, and your representative in Congress.

Exploring the Seas

Throughout much of its history, the United States Navy has led the way in ocean research. Explore this facet of naval activities by viewing *Mission Oceanography*, a navy film that documents the navy's cooperative ventures with industry in various areas of ocean research. Following the film, invite a representative of the United States Navy to discuss current research efforts and their expected military and civilian applications.

13. THE SEA: CONNECTOR OR BARRIER?

"To a considerable extent, the sea is a great natural highway. No energy is required to keep masses of goods afloat, and little to overcome the modest friction of water, unless high speed is wanted. . . . It is hardly surprising, then, that a great part of the world's commerce has always moved—and still moves—by water."

—Herman Kahn

Background

From the Courses by Newspaper Reader

OCEANS: OUR CONTINUING FRONTIER

Supership. The growing dominance of merchant shipping by incredibly large tankers and the threats they pose to the environment are analyzed by journalist Noel Mostert. For additional excerpts from Mostert's bestseller, *Supership*, see the May 13 (pp. 45–48+) and May 20, 1974 (pp. 46–48+) issues of *The New Yorker*.

Commerce and Transportation: Fulfilling Our Commitment. The Marine Board of the National Academy of Engineering suggests that the application of technology might help solve the problems facing the United States' declining merchant fleet now and in the future.

From Popular Periodicals

Author John Frye reviews the promise and perils posed by bigger and bigger tankers in "Oil, Superships and the Oceans" in the January 1974 issue of *Oceans* magazine (pp. 48–55).

The risk-taking entrepreneurs and high-stakes economics of the supertanker industry come to life in "Betting $20 Billion in the Tanker Game" in the August 1974 issue of *Fortune* (pp. 144–149+).

Reporter Lynn Langway and others chronicle the rapid rise and competitive stance of Russia's merchant marine in "Red Sails in the Sunset" in the December 1, 1975 issue of *Newsweek* (pp. 82+).

The United States should act quickly to construct superports to service the world's huge oil tankers, argues Ashton C. Barrett, a federal maritime commissioner, in "Superports" in the September 15, 1974 issue of *Vital Speeches* (pp. 712–714).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Ocean Transportation by Ernst G. Frankel and Henry S. Marcus. The authors analyze the development and status of ocean transportation, including such topics as technology, financing of shipping maritime labor relations, and insurance.

Suggested Discussion Questions

How will seagoing commerce be affected by the threat to freedom of the seas posed by the race for ocean resources? By actions being considered by Law of the Sea Conference delegates?

What is the role of the United States Merchant Marine in the national economy? Its contributions to the national defense?

Should the federal government continue its subsidy of the merchant marine? What steps can be taken to increase the United States Merchant Marine's share of the world's seagoing commerce?

Is there any way to eliminate the reliance by firms and countries on "flags of convenience"? Should American corporations be required to register their ships in the United States?

Should a limit be placed on the size of VLCCs (Very Large Crude Carriers)? What regulations are necessary to lessen the threats these monstrous carriers pose to their crews, the coastlines, and the deep seas?

Program Suggestions and Resources

Access for Ships

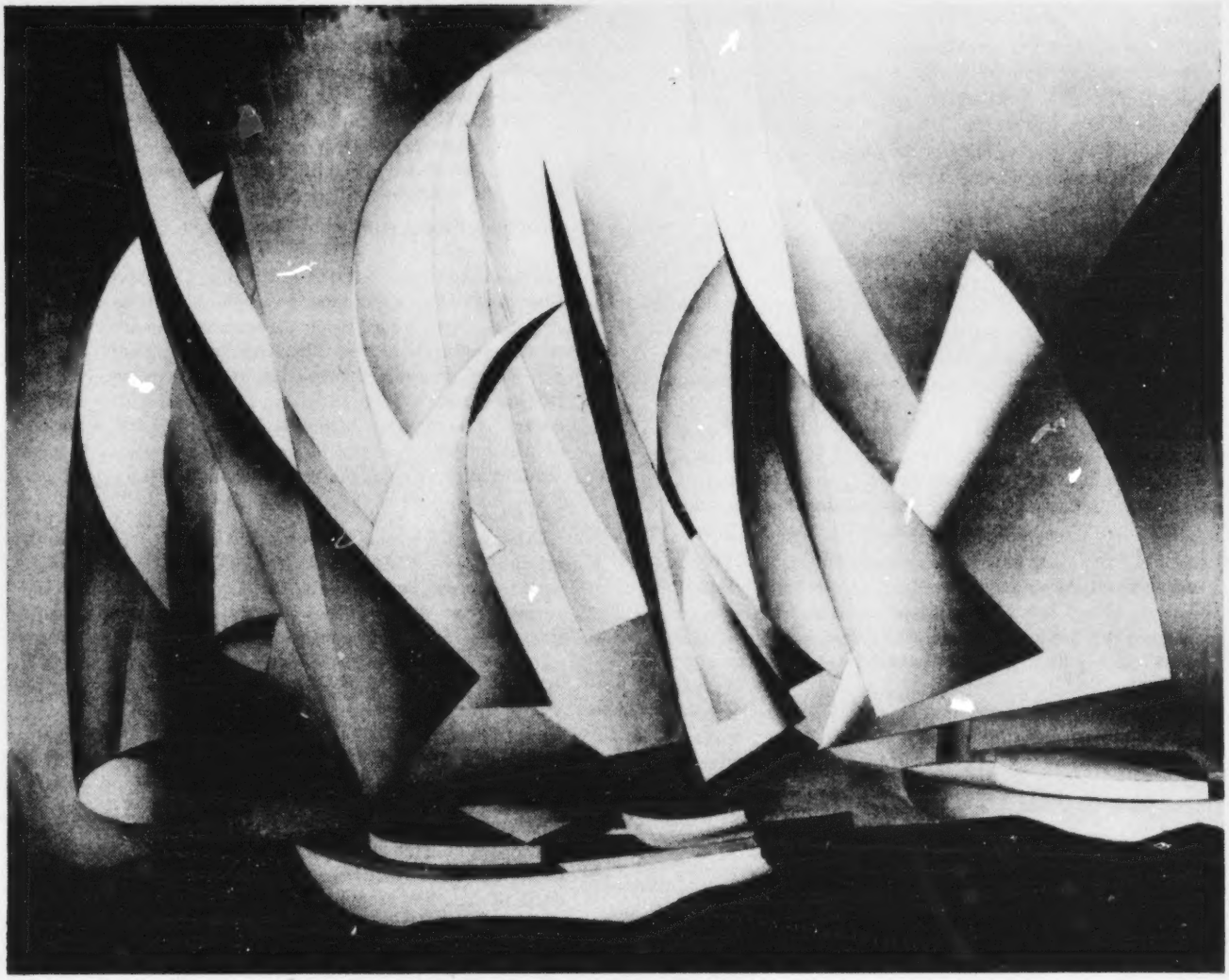
One industry certain to be affected by the outcome of the Law of the Sea Conference is the United States maritime industry. Invite a representative of the merchant marine or a professor of international law or business to discuss potential changes in the freedom of the seas concept and the impact each proposal could have on the shipping industry. Preceding this discussion, view *Shipping*, a history of marine transportation viewed through the eyes of a student at the United States Merchant Marine Academy.

Supership

What are the perils and potentials posed by the increasing reliance on VLCCs (Very Large Crude Carriers) or so-called superships? Should the United States develop "superports" off its shores to serve these huge tankers? Assess the growing impact of superships as well as the arguments for and against construction of superports in a panel discussion. Panelists could include a representative of the state Chamber of Commerce, a member of the American Institute of Merchant Shipping, a member of the Seaman's Union, and a representative of a local or state environmental organization.

Supporting the Merchant Marine

The United States Merchant Marine, the seventh largest in the world, is struggling to maintain its share of international seagoing commerce in the face of growing competition from other maritime nations. For an overview of this situation, invite a representative of the shipping industry and your representative in the United States Congress to discuss the ways government and private industry are working together to bolster this vital industry.



Philadelphia Museum of Art

Charles Sheeler, *Pertaining to Yachts and Yachting*, 1922.

Unit Six: Men and Women at Sea

14. SHIPS AND THE SAILOR

"The sailor is no longer a man set apart. Yet the discipline, the social conventions, the language, even the superstitions of the sea persist, symbols of an ancient and exacting calling."

—J. H. Parry

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

The Medieval Sailor. This image by Geoffrey Chaucer of a seaman—skillful, disreputable, and violent—endured for centuries.

The Minor Horrors of the Sea. Eugenio de Salazar, a judge, describes life aboard ship during his Atlantic crossing in the sixteenth century.

Rotting Ships, Rotting Men. The poor health conditions among eighteenth-century seamen and the discovery of a cure for scurvy, that dread disease that plagued them, are recounted by historian J. H. Parry.

A Naval Officer's View of Naval Discipline. Frederick Chamier, a British novelist who served in the Royal Navy in the 1800s, recalls impressment—conscription that frequently amounted to kidnapping—and the harshly disciplined life aboard navy ships.

A Sailor on Impressment. "An Officer of Rank" argues that impressment is a necessary evil.

Daily Routine in a Sailing Warship. Nineteenth-century British sailor Bill Truck paints a vivid picture of the carefully regulated, highly disciplined routine aboard a navy warship.

Sea Language. Historian J. H. Parry chronicles the specialized use of language that set sailors apart from other people.

Handing Sail in a Squall. Journalist Richard Henry Dana gives a vivid account of his voyage in the mid-1830s as a common sailor aboard the *Pilgrim*, a two-masted ship bound to California from Boston.

A Clipper Captain's View on Steam. The contempt of the sailor for the seaman of the new steamships is bitingly portrayed in this excerpt from John Masefield's *The Bird of Dawning*.

At Sea in Sail: The 1880s. Although sailing ships were improved by technological advances, conditions aboard remained similar to those 150 years before, according to this account by a sailor in the 1880s.

Haul Away, Joe. This chantey, a favorite during the days of sail, often lightened the load of the harshly disciplined sailor.

Life on a Trawler. Social scientist Jeremy Tunstall describes the "tight community" aboard a modern fishing trawler off the coast of England.

From Popular Periodicals

Retired professor and novelist Walter Havighurst describes his frequently uncomfortable sea journey to Alaska in the 1920s in "Way to Alaska: 1923 Voyage on a Schooner Ship" in the February 1974 issue of *American Heritage* (pp. 32–36).

Life aboard a sixteenth-century ship is revealed by a modern-day effort to recreate the around-the-world trip of Sir Francis Drake. See "Replica of Drake's Legendary Galleon Will Brave the Atlantic" in the July 1974 issue of *The Smithsonian* (pp. 62–69).

Writer Robert Gannon describes the disciplined regimen of a crew assigned to an offshore oil rig in "Life on a Rig" in the November 1974 issue of *Oceans* (pp. 64–65).

Books to Review

Selections from the bibliography in the Courses by Newspaper STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

The Trade Winds by C. N. Parkinson. This collection of essays focuses on the shipping industry in the late eighteenth and early nineteenth centuries.

The Way of a Ship by Alan Villiers. This book is a comprehensive account of sailing ships during the last fifty years of sail by an author with wide experience as seaman, master, and owner.

Suggested Discussion Questions

The harsh, disciplined, isolated life aboard ships is comparable to life in what other institutions and/or occupations?

Could shipboard life have been structured in any other way? Is democracy possible aboard a ship?

Considering the less-than-desirable life aboard ship, what factors drew men to the sea in the past? Do these same factors provide incentives today?

What impact did the decline of sailing ships and the subsequent rise of steamers have on the life of the sailor?

What are the primary dangers faced today by those who go to sea? How do these threats compare with those faced by sailors in the past?

How has the image of sailors changed over the years? Today, how are seagoing occupations viewed?

Program Suggestions and Resources

NOTE: Films referred to in the following program suggestions are listed in Section IV. Groups or institutions that may provide speakers and other resources are found in Section III.

Z-grams and the New Navy

Admiral Elmo Zumwalt, former Chief of Naval Operations, it is generally agreed, greatly relaxed many rules responsible for the tight discipline on United States Navy ships. To assess the effects of these changes, invite a representative of the United States Navy to describe life aboard ship in the 1970s and to compare this life style to past ones. Members can be encouraged to recall their own experiences with navy discipline and to assess the impact of these rule changes on the fighting-readiness of this military branch.

The Shipboard Society

Work aboard ships, at one time drastically different from work ashore, now has much in common with land-based jobs. Take a close look at these changes by inviting a sociologist to lead a group discussion on the nature of life aboard modern seagoing vessels. For additional points of view invite a ship's captain or a member of the Seafarer's Union to comment on his experiences at sea.

Fishing for a Living

Those who make their living aboard fishing trawlers today face not only natural perils but economic dangers. For a glimpse of this occupation, view *Two Faces of the Sea*, a film that documents the hazards and rewards shared by a community of hardy Maine fishermen. Following the film, invite a representative of a local fishermen's organization or a representative of the fishing industry to share his concerns for the future stability of this livelihood.

15. WOMEN AND THE SEA

"Women have not fared better at sea than they have on land. As a matter of fact, they have fared much worse and have often been entirely excluded from seagoing activities."

—Constantina Safilios-Rothschild

Background

From the Courses by Newspaper Reader
OCEANS: OUR CONTINUING FRONTIER

Sea Nymphs of Japan. Louis Marden of *National Geographic* magazine introduces the ama, Japan's remarkable women divers who for 2,000 years have dived to depths of seventy-five feet with no breathing apparatuses.

Singlehanders. Sir Francis Chichester, a sailor and adventurer, pays tribute to Ann Davison, who crossed the Atlantic alone in 1952.

Women as Passengers: A Voyage to India. The discomforts faced by women as passengers are related by Emma Roberts, who journeyed to India in the mid-nineteenth century.

Women on Warships: Navy Wives React. The storm of protest that greeted the United States Navy's decision to lift the ban against women serving with men aboard warships at sea is reported by *New York Times* staff writer Linda Charlton.

The Fisherman and His Wife. Sociologist H. Russell Bernard shows how the culturally prescribed role of women on a Greek Island creates conflicts for isolated and lonely wives of seafarers.

From Popular Periodicals

Professor Miriam Williford recalls the lives of two female pirates in "Anne Bonney and Mary Read: Move Over Errol Flynn" in the February 1974 issue *MS* magazine (pp. 24-26).

A woman who has made a living trapping lobster is briefly profiled by free-lance writer and photographer Betty Medsger in "Jenny Crone: Among the Lobsters" in the September 1975 issue of *MS* magazine (p. 51).

Suggested Discussion Questions

In what ways are the barriers faced by women who wanted to go to sea similar to those faced by women breaking into male-dominated professions?

What basic attitudes about women underlie the superstitions about women on board ships? What are the possible explanations for the similarity of these superstitions in numerous cultures?

What are some of the roles assumed by women in seagoing societies such as those found in a fishing village or port? What unique strains are borne by these women?

In what ways, if any, has the women's movement responded to the needs of women in seagoing societies? What steps have been taken by the navy?

Have recent experiences of men and women serving together aboard ship reinforced or dispelled any of the common prejudices that kept women from going to sea? Have any new prejudices been voiced?

Program Suggestions and Resources

They're in the Navy Now

Barred from active duty aboard ships for many years, women in today's United States Navy now may serve shoulder to shoulder with navy men in a variety of jobs both onshore and at sea. Invite a representative of the United States Navy to describe the role of women in this branch of the service. Suggest that the navy representative be accompanied by one or two Waves who could relate the reasons they chose the navy and their life in the armed forces.

Superstition

Throughout history, many cultures have forbidden women to go to sea, supposedly to preserve the safety and "luck" of the ship. Explore these superstitions surrounding women and the sea with the aid of a socialogist, anthropologist, or teacher of women's studies from a local high school, community college or university. Members can be encouraged to raise any superstitions they recall for discussion by the group.

Staying Behind

Generally, women's relationship to the sea has meant lengthy periods of separation from a father, husband or son. To obtain a glimpse into the lives of these women who stay behind, convene a panel. Panelists could include a local sociologist, a representative of the United States Navy, a representative of a women's rights organization, a family or marriage counselor, and a sailor's or fisherman's wife. Prior to this discussion, show *Island in the China Sea*, a film that compares the lives of a farming family and a fishing family.

16. FROM WORK TO SPORT

"... but Poseidon might say that the swimmer fighting a current, the sailor battling a storm, or the small boy protecting his sand castle with a desparate sand pail dam are all aware that they are essentially alone against a fascinatingly unpredictable enemy who can be, when sun, wind, and surf are right, a fascinating friend."

—Heywood Hale Broun

Background

From the Courses by Newspaper Reader

OCEANS: OUR CONTINUING FRONTIER

A Royal Sport. Novelist Jack London captures the triumphs and dangers of wrestling with the sea in the "royal sport" of surfing.

The Quest for the America's Cup: Lipton's Last Try. This report of British merchant and sportsman Sir Thomas Lipton's final unsuccessful attempt to win the prestigious America's Cup captures the excitement of what was the sport of millionaires in the early twentieth century.

The Big One. The challenge of deep-sea sport fishing, which pits man's cunning and skill against some of the most majestic creatures in the ocean, is described here by novelist Zane Grey.

Solitude. Joshua Slocum, who in 1895 began a three-year epic journey that took him around the world, relates the sense of total isolation faced by all who cross the seas alone.

Across the Pacific by Raft. Norwegian voyager Thor Heyerdahl who, with five companions, crossed the Pacific on a balsa-wood raft, shares his questioning of why he accepted the challenge of the sea.

Swimming the Hellespont. The successful effort of English poet Lord Byron to swim the treacherous Dardanelles is related by his biographer, André Maurois.

From Popular Perodicals

The lure of fishing to people from all walks of life throughout history is captured in "Fishing: What's the Catch," a wrap-around section in the August 1974 issue of *Harper's* magazine (pp. 3-10+).

Reporter Richard W. Johnston portrays the excitement and danger of a champion surfing competition in twenty-eight-foot surf off Hawaii in "Board and Vroom on the Big Ones" in the December 9, 1974 issue of *Sports Illustrated* (pp. 28-29).

Long-distance swimmer Diana Nyad analyzes her commitment to her grueling sport in "Mind Over Water" in the October 1975 issue of *Esquire* (pp. 132-139).

Adventurer David Lewis shares his often frightening experiences in his attempt to be the first person to sail alone around Antarctica in "Ice Bird Ends Her Lonely Odyssey" in the August 1975 issue of *National Geographic* (pp. 216-233).

A heavily illustrated account of one crewman's experiences in the "Queen of Great Lakes Sailing Races," the annual contest on Lake Michigan from Chicago to Mackinaw Island, is found in "Heigh-hos for the Mac" by Dan Gerber in the July 28, 1975 issue of *Sports Illustrated* (pp. 24-30+).

A history of the America's Cup races and glimpses into the precision, training and technological innovations that have contributed to the United States' success can be

found in "Campaigning for the America's Cup" by former America's Cup competitor Warwick Tompkins in the January 1976 issue of *Oceans* magazine (pp. 49–57).

Books to Review

Selections from the bibliography in the Courses by Newspaper Study STUDY GUIDE FOR "OCEANS: OUR CONTINUING FRONTIER"

Survive the Savage Sea by Dougal Robertson. The author recounts how he, his wife, their three sons, and a young guest survived for thirty-eight days at sea after killer whales attacked and sunk his schooner west of the Galapagos Islands.

Sailing Alone Around the World by Joshua Slocum. The first solo voyage around the world at the end of the nineteenth century is described matter-of-factly by sea captain Slocum.

Suggested Discussion Questons

What lures men and women away from their natural element—the land—to challenge the unfamiliar and uncertain seas? How do these lures compare with those of outer space or mountain peaks, for example?

Although its natural hazards are considerable, what other dangers does the sea pose to those who challenge it?

In what ways could the emerging view of the oceans as a watery Eldorado affect recreational uses of the world's seas?

Does the creation of a 200-mile economic zone off our shores endanger recreational uses of coastal waters? If so, how can these threats be offset?

What steps must be taken by both the private and public sectors to preserve recreational uses of our seas and seashores for future generations?

Program Suggestions and Resources

Alone With the Deep Blue Sea

Throughout history, adventurers have set out undaunted to conquer the unpredictable seas. Share one such adventure with your group by viewing *The Voyage of the Brigantine Yankee*, a film that chronicles an eighteen-month voyage by an amateur crew from Massachusetts to New Guinea. Following the film, invite a sociology teacher or psychologist to assess the human search on the boundless main for adventure, romance, notoriety, solitude, and a sense of accomplishment.

Sailing, Sailing

The glide of a graceful ship, the splash of the waves, the good, gentle push of the breeze have constantly seduced men and women. Experience the joys and challenge of this popular sport by viewing *Sailing*, an unnarrated survey of sailing craft navigating the ever-changing face of the oceans. Following the film, discuss with the representative of a local sailing club the opportunities to learn and enjoy this sport locally.

The Long-distance Swimmer

The grueling sport of long-distance swimming continues to attract men and women from all walks of life. Invite a swimming coach from a local high school, community college, or university to describe some of the outstanding achievements of these hardy swimmers and to review the intense, constant training required to succeed. If any local person is a long-distance swimmer, invite him or her to share experiences with your group.

The Big One

The joy of landing a huge sport fish has attracted hundreds of thousands of Americans to support the rapidly growing marine sport fishing industry. Invite a representative of this industry to discuss with your group changes, including government regulations, fostered by its growing popularity and its efforts to protect coastal fisheries.

SECTION III

RESOURCES FOR "OCEANS: OUR CONTINUING FRONTIER"

One measure of the importance of the oceans to our nation is the large, ever-growing number of public and private agencies taking an active interest in their development and protection. Below is a sampling of Federal agencies and national and state organizations (listed alphabetically) that can provide resources useful in planning and enriching community programs or class meetings of Courses by Newspaper's course on the oceans. When attempting to contact a government agency by phone, always check the listings under United States Government or the name of your state. For assistance, call the state or federal operator.

Agencies of the Federal Government

International Decade of Ocean Exploration

National Science Foundation
Washington, D.C. 20550

Resources: Publications, films

Carried out under the auspices of the United Nations, the International Decade of Ocean Exploration (IDOE) is an international effort to accelerate progress toward effective utilization of the oceans and their resources through a series of decade-long cooperative investigations. The United States contribution to IDOE, managed by the National Science Foundation, has concentrated its efforts in four areas: environmental quality, environmental forecasting, seabed assessment, and living resources.

Several of the research projects undertaken during IDOE have been documented in feature films that could be used to enrich discussions of the Courses by Newspaper topics. Below is a sampling of IDOE films.

The Well of Life. The twin dramas of the oceans' life cycles and scientists' efforts to probe their mysteries are presented in this film. The focus is on IDOE research on coastal upwelling, the little-understood process by which the oceans continuously renew their resources. (27 min., available from Alpha Cine Labs, 1001 Lenora St., Seattle, WA 98121.)

The Turbulent Ocean. This documentary depicts the planning and execution of one of the largest deep-sea expeditions in twentieth-century oceanographic research. The goal: to find and document strange and not-yet-understood motions beneath the surface of the sea. (60 min., available from Centre Films, Inc., 1103 N. El Centro Avenue, Hollywood, CA 90038.)

Boundary of Creation. Science Editor of the *New York Times* Walter Sullivan describes the efforts of American and French scientists involved in Project FAMOUS to understand the ever-changing geology of the earth and particularly the mid-ocean ridges off the Azores. (27 min., available from NOAA Film Library, 12227 Wilkins Avenue, Rockville, MD 20852.)

For a complete listing of IDOE films, write IDOE in Washington, D. C.

Research efforts in each of the four IDOE program areas is being compiled in booklets designed for the general public. A sample copy of the first report *Deep Sea Searches: The Story of the Seabed Assessment Program,* which summarizes efforts to understand sea-floor processes responsible for the formation of mineral and petroleum resources, is available from IDOE's Washington headquarters. Additional copies at $1.10 each can be ordered from the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402. Refer to stock number 033-000-00248-1. For information on the next scheduled report on environmental forecasting, efforts to improve forecasting of storms, and other ocean-based weather phenomena, contact IDOE in Washington, D.C.

Articles on IDOE research projects frequently appear in the National Science Foundation's bimonthly magazine *Mosaic.* For example, in the Summer, 1973 issue, an article titled "Circulation of the Oceans" reported on a comprehensive study of ocean currents; and in the November/December 1975 issue, the Project FAMOUS expedition is chronicled in "The Seams of the Earth." If this publication is not available in local libraries, it can be ordered for a cost of $8.55 annually from the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402.

Maritime Administration, United States Department of Commerce

Washington, D.C. 20230

Resources: Publications, speakers

The Maritime Administration, a division of the United States Department of Commerce, is responsible for fostering the development and encouraging the maintenance of the United States Merchant Marine. Toward these ends, the Maritime Administration maintains offices in seven port cities: New York, New York; New Orleans, Louisiana; San Francisco, California; Chicago, Illinois; Seattle, Washington; Long Beach, California; and Houston, Texas. Personnel at these offices, particularly in the Office of Market Development, could be helpful in explaining the government's role in expanding the United States Merchant Marine.

Informative publications available free from the administration's Washington, D.C. headquarters include "The United States Merchant Marine: A Brief History," "United States Merchant Fleet Pictures" (photographs) that capture recent advances in merchant marine technology), and "The United States Merchant Marine Academy," a description of the training facility located at Kings Point, New York. A free catalog of publications also is available upon request.

National Marine Fisheries Service

National Oceanic and Atmospheric Adminjstration
United States Department of Commerce
Washington, D.C. 20235

Resources: Speakers, publications

A division of the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service (NMFS) was created in 1970 to protect and promote the wise and full utilizaton of marine fisheries resources. Thus its concerns range from assessment of both commercial and sport marine fishing stocks to fish production in hatcheries and by aquaculture to conservation of marine mammals. Personnel at the following fisheries centers maintained by NMFS could serve as speakers or assist in locating resource persons to discuss NMFS projects:

Atlantic Estuarine Fisheries Center
Pivers Island, P.O. Box 570
Beauford, NC 28516

Gulf Coastal Fisheries Center
Fort Crockett, Building 302
Galveston, TX 77550

Middle Atlantic Coastal Fisheries Center
P. O. Box 428
Highlands, NJ 07732

Northeast Fisheries Center
Woods Hole, MA 02543

Northwest Fisheries Center
2725 Montlake Boulevard East
Seattle, WA 98102

Southeast Fisheries Center
75 Virginia Beach Drive
Miami, FL 33149

Southwest Fisheries Center
8604 La Jolla Shores Drive, P.O. Box 271
La Jolla, CA 92037

Research on aquaculture technology, pollution control, and the development of products from under-utilized fishery resources is conducted at the NMFS Fishery Products Technology Centers and Laboratories listed below. Again, personnel at these centers could be contacted to participate in Courses by Newspaper discussions.

Atlantic Fishery Products Technology Center
Emerson Avenue
Gloucester, MA 01930

College Park Fishery Products Technology Laboratory
Regents Drive, University of Maryland Campus
College Park, MD 20740

Kodiak Fishery Products Technology Center
P. O. Box 1036
Kodiak, AK 99615

Pacific Fishery Products Technology Center
2725 Montlake Boulevard East
Seattle, WA 98102

Pascagoula Fishery Products Technology Laboratory
3209 Frederick Street, P.O. Drawer 1207
Pascagoula, MS 39568

Samples of the various NMFS technical publications on the economics and availability of specific fishing stocks are available at the NMFS regional offices in Juneau, Alaska; Gloucester, Massachusetts; Seattle, Washington; St. Petersburg, Florida; and Terminal Island, California, and from NMFS offices (Statistics and Market News Division) in New Orleans, Louisiana; Boston, Massachusetts; and New York, New York. *Fisheries of the United States*, an annual compilation of data by NMFS about America's fishing industry, and *Fishery Bulletin*, a scientific journal on fisheries-related subjects published quarterly, may be available in local libraries or my be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Copies of *Fisheries of the United States* are $1 each and subscriptions to *Fishery Bulletin* are $10.85 annually.

National Oceanic and Atmospheric Administration

United States Department of Commerce
Rockville, MD 20852

Resources: Speakers, publications, films

The National Oceanic and Atmospheric Administration (NOAA), a division of the United States Department of Commerce, was formed to coordinate the exploration, management, and protection of the oceans and their resources. (Two divisions of NOAA working toward these goals, the National Sea Grant Program and the National Marine Fisheries Service, are listed separately.) One important effort undertaken under NOAA's jurisdiction is the National Ocean Survey, which today, in addition to its traditional surveying and mapping activities, is concerned with land use and the environment along the nation's coasts. Personnel at the following National Ocean Survey centers could be contacted to serve as resource persons for community programs and classroom discussion sessions.

NOAA Atlantic Marine Center
National Ocean Survey
439 West York Street
Norfolk, VA 23510

NOAA Pacific Marine Center
1801 Fairviw Avenue East
Seattle, WA 98102

NOAA Lake Survey Center
630 Federal Building
Detroit, MI 48226

Much of the research on the marine ecosystem sponsored by NOAA is centered at its Environmental Research Laborities in Boulder, Colorado. Information on such projects

as Marine Ecosystem Analysis, Marine Environmental Assessment, Deep Ocean Mining Environmental Study, wave propagation studies, and ocean dumping monitoring and research is available by contacting the public information officer at the laboratory facility in Boulder or by writing to the attention of the specific project, Environmental Research Laboratories, Boulder, CO 80302. Additional research is undertaken at the Atlantic Oceanographic and Meteorological Laboratories, 15 Rickenbacker Causeway, Virginia Key, Miami, FL 33149 and at the Pacific Marine Environmental Laboratory, 3711 15th Avenue N.W., Seattle, WA 98105.

Under the provisions of the Coastal Zone Management Act of 1972, NOAA's Office of Coastal Zone Management was created to lead a comprehensive local, state, and federal effort to manage the coastal environment and its resources. For information about the various activities of this office, contact the Office of Coastal Zone Management, United States Department of Commerce, Room 350, 2001 Wisconsin Avenue, Washington, D.C.

To publicize its many activities and projects, NOAA maintains an extensive film library that loans films to the general public free of charge. Because the films are heavily booked, requests must be submitted at least three months prior to the planned viewing date to Motion Picture Service, Department of Commerce, NOAA, 12231 Wilkins Avenue, Rockville, MD 20852. The following is a sampling of films from NOAA related to Courses by Newspaper topics.

Estuarine Heritage. This film stresses the importance of estuaries as a habitat for fish, waterfowl, and other animals and as a valuable recreational resource and depicts the major threats to these vital coastal areas. (28 minutes, color)

Outboard Fishermen U.S.A. The contribution of small, independent, commercial fishermen to the national economy is chronicled in this film. (27 minutes, color)

Complete catalogs of NOAA films and its many publications, including reports on its various research projects, are available from NOAA headquarters in Rockville, Maryland.

In addition to being depicted in films, NOAA's many projects are frequently the subjects of articles in its quarterly magazine *NOAA*. If this magazine is not available in local libraries, a subscription at $7.90 annually can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402.

The National Sea Grant Program

Office of Sea Grant
National Oceanic and Atmospheric Administration
United States Department of Commerce
Rockville, MD 20852

Resources: Information on marine scientists and research
A part of the National Oceanic and Atmospheric Administration in the United States Department of Commerce, the National Sea Grant Program is dedicated to developing marine resources much in the same manner that the land grant program worked to develop agriculture and engineering a hundred years ago. Since its formation 10 years ago, the National Sea Grant program has funded interdisciplinary projects concerned with the conservation, proper management and maximum social and economic utilization of marine resources. At present, 10 educational institutions have been designated Sea Grant Colleges and 17 others have received funding for a variety of programs.

By contacting the educational institution nearest you active in the Sea Grant Program, you will have access to persons who could describe current marine research and the scope and activities of the Sea Grant Program. For information on persons or institutions involved in a specific area of research, contact Public Information Officer Brian Gorman at the program's administrative headquarters in Maryland.

The following is a list of educational institutions with active Sea Grant programs. Those designated Sea Grant Colleges are starred.

Dr. Edward Chin
Director, Sea Grant Program
University of Georgia
110 Riverbend Road
Athens, GA 30602
(404)542-7671

Dr. B. J. Copeland, Director
North Carolina Sea Grant Program
1235 Burlington Laboratories
North Carolina State University
Raleigh, NC 27607
(919)737-2454

Dr. Robert W. Corell
Deputy Director, Sea Grant Program
UME/UNH Joint Program
University of New Hampshire
Durham, NH 03824
(603)862-1053

Dr. William S. Gaither
Dean, College of Marine Studies
*University of Delaware
Newark, DE 19711
(302)738-2841

Mr. Walter Gray
Acting Coordinator, Sea Grant Program
210B Woodward Hall
*University of Rhode Island
Kingston, RI 02881
(401)792-2553

Dr. Roy W. Hann Jr.
Acting Director
Center for Marine Resources
Oceanography and Meteorology Bldg.
*Texas A&M University
College Station, TX 77843
(713)845-4016

Mr. Dean A. Horn
Acting Director, Sea Grant Program
Massachusetts Institute of Technology
Cambridge, MA 02139
(617)253-7041

Dr. Frederick Hutchinson
Director, Sea Grant Program
UME/UNH Joint Program
Research and Public Service
Coburn Hall
University of Maine
Orono, ME 04473
(207)581-7048

Mr. Donald Keach
Director, Sea Grant Program
University of Southern California
University Park
Los Angeles, CA 90007
(213)746-6164

Mr. Ronald B. Linsky
Director, Sea Grant Program
*University of Hawaii
2540 Maile Way
Honolulu, HI 96822
(808)948-7031

Dr. Stanley R. Murphy
Director, Sea Grant Program
Division of Marine Resources
*University of Washington, HG-30
Seattle, WA 98195
(206)543-6600

Dr. Hugh L. Popenoe, Director
*State University System Sea Grant Program
2001 McCarty Hall
University of Florida
Gainesville, FL 32611
(904)392-1965

Dr. Robert A. Ragotzkie
Sea Grant College Program Director
*University of Wisconsin
1800 University Avenue
Madison, WI 53706
(608)263-6811

Dr. James J. Sullivan
Sea Grant College Program
*University of California, San Diego
La Jolla, CA 92093
(714)452-4440

Dr. Jack R. Van Lopik, Director
Center for Wetland Resources
Coastal Studies Building
Louisiana State University
Baton Rouge, LA 70803
(504)388-1558

Prof. William Q. Wick, Director
Sea Grant College Program
Administrative Services Bldg., A320
*Oregon State University
Corvallis, OR 97331
(503)754-2714

Dr. Bruce T. Wilkins, Acting Director
SUNY/Cornell Sea Grant Program
*State University of New York
99 Washington Avenue
Albany, NY 12210
(518)474-5787

Dr. Dean F. Bumpus
Sea Grant Coordinator
Woods Hole Oceanographic Institution
6 Water Street
Bigelow Building
Woods Hole, MA 02543
(617)548-1400, ext. 539

Dr. L. G. Eldredge
Director, Sea Grant Program
Marine Laboratory
University of Guam
P.O. Box EK
Agana, Guam 96910
Guam: 749-2421

Dr. William J. Hargis, Jr.
Director
Virginia Institute of Marine Science
Gloucester Point, VA 23062
(804)642-2111

Dr. Edwin B. Joseph, Director
Marine Resources Center
P.O. Box 12559
Charleston, SC 29412
(803)795-6350

Dr. Theodore H. Kerstetter
Sea Grant Coordinator
Marine Laboratory
Humboldt State University
P.O. Box 624
Trinidad, CA 95570
(707)677-3671

Dr. Eugene H. Man, Dean
Office of Research Coordination
University of Miami
P.O. Box 248293
Coral Gables, FL 33124
(305)284-4541

Dr. Bruce W. Mattox, Director
Mississippi-Alabama Sea Grant Consortium
P.O. Drawer AG
Ocean Springs, MS 39564
(601)875-9341

Dr. Charles G. Overberger
Acting Director, Sea Grant Program
4080 Administration Building
University of Michigan
Ann Arbor, MI 48109
(313)764-1185

Dr. Donald H. Rosenberg
Director, Sea Grant Program
University of Alaska
O'Neill Resources Building
Fairbanks, AK 99701
(907)479-7086

Dr. Lionel A. Walford, Director
New Jersey Marine Sciences Consortium
Fort Hancock, NJ 07732
(201)872-1478

United States Department of the Interior
Washington, D.C. 20242

Resources: Publications, films

As the nation's principal conservation agency, the Department of Interior is active in three areas that are relevant to Courses by Newspaper's program on the oceans: water resources, wildlife resources, and saline water conversion. (The United States Geological Survey, a division of the Department of Interior, is listed separately.) Publications that describe the department's work in these areas are available to the public and would be useful in course-related programs. A sample of these publications is listed below:

River of Life, Water: The Environmental Challenge. The first environmental report in the department's Conservation Yearbook Series, this publication reports efforts to regulate, study and conserve the "environmental life substance"—water. (S/N 2400-0057, $3.15)

Sport Fishing, USA. This 464-page report on all aspects of marine and fresh water sport fishing covers selective breeding, stocking, and intensive management programs for sport fishing stocks. (S/N 2410-00235, $10)

Wrightsville Beach Test Facility. The desalting test facilities operated by the Office of Saline Water in North Carolina are described in this booklet. (S/N 2400-00479, $.30)

The above publications are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402. A check or money order made payable to the Superintendent of Documents must accompany all orders.

The following is a sampling of rent-free Department of Interior films relevant to course topics:

California Grey Whale. Both the biology and history of one of nature's largest creatures are featured in this twenty-two-minute film. (Order from Film Librarian, Harpers Ferry Historical Association, P. O. Box 147, Harpers Ferry, WV 25425.)

New Water for a Thirsty World. This twenty-two-minute film chronicles the potential and current research efforts in saline water conversion. (Order from Office of Water Research and Technology, U. S. Department of Interior, Washington, D.C. 20240.)

United States Department of the Navy
(For locations, see list of naval districts below.)

Resources: Films, speakers

The United States Navy, through the office of the Oceanographer of the Navy, has played an active role in modern oceanographic research. Many of its efforts and findings have been chronicled on films that are available to the general public free of charge. (See the filmography in Section IV for reference to some of these films.) In addition to films on oceanographic research, the navy film library includes films on sea power, navy life, and the navy's role in national defense. For information on how to obtain these films, contact the public affairs office of the nearest naval district.

The public affairs office also will assist in locating navy speakers on such course topics as sea power and men and women at sea. When contacting a public affairs officer, specify your topic so that you can be referred to the appropriate command.

Below is a list of naval districts and their central phone numbers:

First Naval District, 495 Summer Street, Boston, MA 02210, (617)491-4637

Third Naval District, Brooklyn, NY 11251, (212)834-2793

Fourth Naval District, Philadelphia, PA 19112, (215)755-3271

Fifth Naval District, Bldg. N-26, Norfolk, VA 23511, (804)444-2355

Sixth Naval District, Naval Base, Charleston, SC 29408, (803)743-3890

Eighth Naval District, New Orleans, LA 70147, (504)361-2541

Ninth Naval District, Bldg. 1, Naval Base, Great Lakes, IL 60088, (312)688-4777

Eleventh Naval District, San Diego, CA 92132, (714) 235-3534

Twelfth Naval District, Bldg. 1, Treasure Island, San Francisco, CA 94130, (415)765-6056

Thirteenth Naval District, 7500 Sand Point Way, N.E., Seattle, WA 98115, (206)527-3226

United States Environmental Protection Agency
Washington, D.C. 20460

Resources: Publications, speakers

Since its formation, the Environmental Protection Agency (EPA) has been involved in regulating and researching ocean pollution, particularly that pollution caused by ocean dumping. For background on recently passed legislation that regulates ocean dumping, two EPA publications could be helpful: "The Marine Protection Research and Sanctuaries Act of 1972 Highlights," a pamphlet that outlines recent legislation on ocean dumping, and "Ocean Dumping in the United States—1975," a report that summarizes the agency's efforts to enforce ocean-dumping laws. Both are available from EPA headquarters in Washington, D.C. or from regional EPA offices in Boston, Massachusetts; New York, New York; Philadelphia, Pennsylvania; Atlanta, Georgia; Chicago, Illinois; Dallas, Texas; Kansas City, Kansas; Denver, Colorado; San Francisco, California; and Seattle, Washington.

As part of its efforts to enforce the Marine Protection, Research and Sanctuaries Act of 1972, the EPA has established marine research facilities at three locations: Narragansett, Rhode Island; Gulf Breeze, Florida; and Corvallis, Oregon. Personnel at these laboratories who are actively involved in research projects to determine the ecological effects of ocean disposal could serve as resource persons on the topic of ocean pollution.

United States Geological Survey

Department of the Interior
Reston, VA 22092

Resources: Publications, speakers

The United States Geological Survey, a division of the Department of Interior, surveys the continental shelf and ocean floor to assess mineral resources and is charged with leasing and management of energy resources found there. The following publications by the survey could be valuable in discussions of the development of marine resources.

Leasing and Management of Energy Resources on the Outer Continental Shelf. This forty-page publicaton reviews the history of offshore oil development, its regulation, and leasing procedures. Included is a bibliography of related publications.

Marine Geology: Research Beneath the Sea. The nature of the ocean floor, bottom sediments, and underlying rocks are discussed in this sixteen-page booklet.

Why Is the Ocean Salty? The origin of the oceans and the composition of their waters are the topics of this sixteen-page booklet.

Limited quantities of these and other Geological Survey publications are available, usually free of charge, from Survey Public Inquiries Offices in Anchorage, Alaska; Los Angeles, California; San Francisco, California; Denver, Colorado; Washington, D.C.; Dallas, Texas; Salt Lake City, Utah; Reston, Virginia; and Spokane, Washington. These publications also may be ordered from the U.S. Geological Survey, Branch of Distribution, 1200 South Eads Street, Arlington, VA 22202.

The Public Inquiries Offices, the national headquarters, and regional offices in Denver, Colorado and Menlo Park, California also are likely sources of resource persons who could serve as speakers on both marine research and the federal government's procedures for leasing the outer continental shelf.

United States Senate Subcommittee on Oceans and the International Environment

Senator Claiborne Pell, Chairman
Dirkson Senate Office Building
Washington, D.C. 20510

Resources: Testimony presented at hearings of the subcommittee

Since 1967 when Senator Pell became its chairman, this Senate subcommittee has conducted numerous hearings on law of the sea questions and on the development of deep-seabed resources. Requests for copies of testimony before the subcommittee, which would provide background information on these two crucial issues, should be made in writing to the subcommittee office.

Private Organizations and Interest Groups

American Institute of Merchant Shipping

1625 K Street, N.W.
Washington, D.C. 20006

Resources: Contacts in the shipping industry

The American Institute of Merchant Shipping (AIMS) represents thirty-four companies that operate more than two-thirds of all active, privately owned ships registered under the United States flag. Its pamphlet "American Institute of Merchant Shipping," available at no charge from AIMS' Washington office, includes a list of member companies that could provide resources for discussions of the United States Merchant Marine. Also available are copies of testimony by AIMS executives before congressional committees that describe the current services and future plans of the American shipping industry.

The American Petroleum Institute

2101 L Street, N.W.
Washington, D.C. 20037

Resources: Pamphlets, speakers

Representatives of the American Petroleum Institute (API) can be called upon to describe the oil industry's involvement in the development of undersea oil reserves both in the shallow and the deep waters of the continental shelf. To bring an API representative to your meeting, contact the Washington headquarters (Office of Programs and Services), the regional offices in Chicago, Illinois, Hartford, Connecticut, or Atlanta, Georgia, or any of the thirty-four state petroleum councils.

The API publication on offshore drilling, "The Why and How of Undersea Drilling," is an informative handout and and is available free of charge in quantities up to 100 copies from the API Publications and Distribution Center located in their Washington, D.C. office. Also available from the Publications and Distribution Center is a free catalog of publications, including many statistical summaries about the oil industry and a listing of movies about oil.

The Cousteau Society

777 Third Avenue, New York, NY 10017
8150 Beverly Blvd., Suite 302, Los Angeles, CA 90048

Resources: Newsletter, film-lecture series

Well known for his award-winning films about the sea and his monthly columns in *Saturday Review*, Captain Jacques Cousteau now heads an organization bearing his name that is dedicated to "the protection and improvement of life." As part of its commitment to make information about the oceans available to the public, the Cousteau Society publishes a bimonthly newsletter, *Calypso Log*, which regularly features articles on marine policy and research and information about society activities. Each issue also features a detailed description of the sea plant or animal pictured in a brightly colored photo poster. If copies of the *Calypso Log* are not available in local libraries, sample copies are available from the society's West Coast office.

The Cousteau Story, a two-part lecture film program that highlights exploration of the sea and efforts to preserve

its environment, could be scheduled to kick off a community program based on the Courses by Newspaper series. Although the fee for the program, which is hosted by Cousteau Society staff member Bill MacDonald, is steep ($750–$1,000), admission fees may be charged to recoup expenses. For tour information, contact Lordly and Dame, 51 Church Street, Boston, MA 02116 or University Speakers Agency, 7730 Herschel Avenue, La Jolla, CA 92037.

If this program is too costly for your organization, contact your local television stations for information on the scheduled reruns of Captain Cousteau's popular underwater adventure series. Schedule information can be relayed to members and students via meeting announcements or newsletters.

Friends of the Earth

529 Commercial
San Francisco, CA 94111

Resources: Speakers, magazine

The earth's water resources are a major interest of this world-wide environmental organization. Its semimonthly magazine, *Not Man Apart*, frequently carries articles on marine topics—such as the article in the mid-May 1976 issue on threats to the porpoise population posed by the tuna-fishing industry. Copies of this magazine, sent free of charge to members, are available in many public libraries.

Members of the Friends of the Earth branches, now located in thirty-four states, frequently are informed on ocean-related topics and can serve as resource persons in discussions of Courses by Newspaper topics. If you are unable to locate a branch in your state, contact the Friends of the Earth headquarters in San Francisco.

International Oceanographic Foundation

3979 Rickenbacker Causeway
Virginia Key, Miami, FL 33149

Resources: Magazine, films, speakers, special exhibit

In fulfilling its goal to advance science, research, and knowledge of the oceans, the International Oceanographic Foundation (IOF) makes available many resources that would be useful in Courses by Newspaper's educational program.

Since its founding almost a quarter of a century ago, IOF has published *Sea Frontiers*, a bimonthly magazine popular for its timely and clearly written descriptions of advances in oceanic research. Many articles in this publication are listed in Section II as good sources of background information on the course topics. Back issues are available for $1.25 each, plus $.21 postage. The cost for a Xerox copy of a specific article is $.20 per page, a fee that includes postage and handling.

A listing of films in the IOF's extensive film library is available by writing to Film Librarian at the foundation's address. Films must be requested at least five months in advance of the scheduled showing. Rental fees to cover the costs of shipping and handling are $10 for members and $12 for nonmembers who live in Florida; and $12 for members and $14 for nonmembers who live outside of Florida.

Roger Conklin, publicist for the foundation, is well known across the nation for his informative lectures on the oceans. To invite Mr. Conklin to speak before your organization or class, contact him directly at the foundation. His fee is negotiable, and a minimum notice of two weeks is requested.

Finally, if your group is fortunate enough to be in the vicinity of Miami, plan to visit Planet Ocean, the IOF's recently opened ocean science environment center. Included in the more than 100 exhibits are the submersible *Deep Diver*, nodules of manganese from the ocean floor, and an eighteen-foot-high, eleven-ton submarine oil-well head. Regularly shown is the award-winning film, *The Unlikely Planet*, which features a journey among the planets in search of life.

Law of the Sea Institute

University of Rhode Island
Kingston, RI 02881

Resources: Publications

As part of its efforts to serve as a medium for discussion of issues dealing with management, control, and utilization of the marine environment, the Law of the Sea Institute maintains a sizable list of publications, including the proceedings of its annual conferences, workshop reports, occasional papers, and bibliographies. Below is a sampling of publications that might be useful in Courses by Newspaper programs:

Tuna: A World Resource. This occasional paper by J. L. Kask is an in-depth examination of the world's tuna indutry. (OP2, $1)

Some Thoughts on Fisheries and a New Conference on the Law of the Sea. William T. Burke, a Courses by Newspaper author, examines the objectives of the Law of the Sea Conference in relation to fisheries. (OP9, $1)

Law of the Sea Briefing: Reflections on the Caracas Session of the United Nations Law of the Sea Conference. This verbatim transcript features reports on many aspects of the Caracas session of the Law of the Sea Conference by United States government representatives and spokespeople for private interests. (OP24, $3)

Law of the Sea: A Bibliography of the Periodical Literature of the 1970's. Listed in the publication are brief annotations for relevant articles from more than 200 journals. (SP4, $5)

To order any of these publications or to request a publications catalog, write the institute. Include $.50 on orders of less than $5 to cover postage and handling.

Marine Careers Institute

80 Boyston Street, Suite 512
Boston, MA 02116

Resources: Publication

As a result of a project assessing the state of marine education in the United States, the Marine Careers Institute has developed a community resource directory that could be of assistance in planning local marine education programs such as Courses by Newspaper's program on the oceans. In this directory are suggestions for identifying and using local resources in marine education classes. Free copies of this publication are available from the institute at the above address.

Marine Technology Society

1730 M Street, N.W.
Washington, D.C. 20036

Resources: Publication

This nonprofit organization composed of professionals in marine-related fields have compiled *The Oceans and You* an information guide to oceanography as a career that lists many sources of information that could be tapped for Courses by Newspaper programs. For example, included are educational institutions that offer four-year marine science programs or two-year technical training programs, a current bibliography that touches almost every facet of marine science, and government and private organizations that are sources of information on marine topics.

This publication can be ordered by writing Oceanography Information Booklet, 1730 M Street, N.W., Washington D.C. 20036. Cost of the booklet is $3 each for 1-9 copies, and $2.50 each for 10-100 copies. Payment must accompany orders.

The National Academy of Sciences

2101 Constitution Avenue
Washington, D.C. 20418

Resources: Publications

Three boards of the National Research Council of the prestigious National Academy of Sciences have published studies relevant to the topics of "Oceans: Our Continuing Frontier." These comprehensive, meticulously researched publications are excellent sources of background information. Below is a sampling of publications available from each board—the Ocean Affairs Board, the Maritime Transportation Research Board, and the Marine Board.

• From the Ocean Affairs Board:

Petroleum in the Marine Environment. This recent study assesses existing information in this crucial area of ocean research, indicates gaps in knowledge, and suggests new directions of study. (ISBN 0-309-02311-4, $6.50)

Assessing Potential Ocean Pollutants. This report summarizes the results of a study to find ways to predict which materials might have an undesirable environmental impact or jeopardize future ocean resources. (ISBN 0-309-02325-4, $6.75)

• From the Maritime Transportation Research Board:

Toward an Improved U.S. Merchant Marine. This report describes a wide spectrum of maritime activities that affect the United States Merchant Marine and suggests priorities for research. (AD A021103, $5.50.)

Nuclear Merchant Ships. This study recommends a strategy for developing United States flag nuclear-powered merchant ships. (ISBN 0-309-02318-1, $6.75)

Port Development in the United States. In this report, the implications of technological change and public policies for port planning, development, and operation are described. (ISBN 0-309-02448-X, $6.50)

• From the Marine Board:

Mining in the Outer Continental Shelf and in the Deep Ocean. This report assesses the mineral resources deposited on the ocean floor and recommends plans to exploit these resources without damage to the marine environment. (ISBN 0-309-02405-6, $6.25)

Toward Fulfillment of a National Ocean Commitment. Presented in this report are suggestions from engineers for the effective utilization of all the seas' resources. (ISBN 0-309-01936-2, $4.95)

Publications that have a serial number beginning with ISBN may be ordered from the Printing and Publishing Office of the National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C. 20418. Those with a serial number beginning with AD must be ordered from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22151. Refer to the title and serial number when placing orders, and be sure to include a check or money order for the total cost of your order. A free catalog listing all the publications of the National Academy of Sciences is available from the Printing and Publishing Office upon request.

National Audubon Society

950 Third Avenue
New York, NY 10022

Resources: Magazine

The conservation of sealife and its habitat, a growing concern of the National Audubon Society, is frequently the topic of articles in its bimonthly magazine, *Audubon.* Some recent articles related to the Courses by Newspaper topics are listed under the heading "Background From Popular Periodicals" in Section II. If this magazine, sent free of charge to society members, is not available in local libraries, back issues may be ordered from the society's offices in New York.

National Geographic Society

P. O. Box 2895
Washington, D.C. 20013

Resources: Magazine

National Geographic, the familiar magazine of the National Geographic Society, regularly carries articles on marine research and marine flora and fauna. Some of these articles are listed under "Background From Popular Periodicals" in Section II of this book. If this publication is not available in local libraries, back issues may be ordered from the society's Washington headquarters.

National Maritime Union of America

See Seafarers International Union

The National Wildlife Federation

1412 16th Street, N.W.
Washington, D.C. 20036

Resources: Magazine, publication

The plight of marine animals and threats to the marine environment are frequent topics of articles in *National Wildlife,* the bimonthly publication of the National Wildlife Federation. Some articles from this magazine are listed in Section II under the heading "Background From Popular Periodicals." If this periodical is not available in local libraries, back issues may be ordered from the federation's Washington, D.C. office.

The National Wildlife Federation also publishes annually a comprehensive list of federal and state agencies and national and state-wide interest groups active in conser-

vation. This *Conservation Directory* is available for $3 from the federation's Washington, D.C. office.

The Navy League of the United States

818 18th Street, N.W.
Washington, D.C. 20006

Resources: Speakers, magazine

With branches in 342 communities across the country, the Navy League strives to bring information on all the nation's maritime services to the general public. Members of the Navy League could serve as speakers and panelists or they can help you find local resources to enrich your programs. Consult your phone directory or the Navy League headquarters for the branch nearest you.

To sample the league's point of view, consult their magazine, *Sea Power*, available on the newsstands, in many local libraries, from local leagues, or from its Washington headquarters.

Ocean Education Project

245 Second Street, N.E.
Washington, D.C. 20002

Resources: Publications, newsletter

The Ocean Education Project (OEP), a nonprofit organization, is attempting to influence the development of a sound and equitable law of the sea through public education and lobbying of delegates to the United Nations Conference on Law of the Sea. The OEP newsletter *Soundings* reports and comments on activities and events related to law of the sea. *Soundings* is available for $5 annually from OEP's Washington headquarters.

OEP also makes available several publications that are useful as summaries of various law of the sea issues such as deep-seabed mining, fisheries management, and division of oil revenues. For sample copies and a complete list of these publications, contact OEP in Washington, D.C.

Oceanic Education Foundation

3710 Whispering Lane
Falls Church, VA 22041

Resources: Ocean studies curriculi

The Oceanic Educational Foundation, under the leadership of Gilven M. Slonim, is dedicated to expanding the study of the oceans throughout the levels of the educational system. Toward this end, the foundation has worked to develop multidisciplinary oceans courses for high school and college students that are offered at educational institutions across the country. Recently the foundation has been active in developing courses to prepare teachers to offer ocean studies programs.

For additional information on the work of the foundation contact Mr. Slonim at the above address.

The Oceanic Society

Eastern National Office: **111 Prospect Street**
Stamford, CN 06902
Western National Office: **240 Fort Mason**
San Francisco, CA 94123

Resources: Magazine, speakers

Founded to preserve and protect the life-nurturing resources of the oceans, the Oceanic Society seeks to broaden public knowledge of marine affairs through publicaton of its bimonthly magazine, *Oceans*, and through its organization of membership chapters.

Many of the informative and beautifully illustrated articles that have appeared in *Oceans* are listed in Section II under the heading "Background From Popular Peridicals." If *Oceans* is not available in your local library, back issues may be ordered or Xerox copies of specific articles requested from the Oceanic Society's office in San Francisco. Back issues of 1976 issues are $2 each and 1975 issues are $3.00 each. Copies of articles are $.50 each, a fee that includes postage and handling.

Regional chapters of the Oceanic Society can provide information about local and area resources that would be useful in classroom or community programs on the oceans. Some chapters have developed film-lecture programs and regularly scheduled field trips as part of their educational endeavors. Below are the contact persons, phone numbers and addresses of Oceanic Society regional chapters.

Ann Howe
Long Island Sound Task Force
50 West 40th Street, Suite 415
New York, NY 10018
(212)431-4081

Peter Vanadia
Oceanic Society
Mid-Atlantic Region
P.O. Box 13357
Philadelphia, PA 19101

Dr. James German
Oceanic Society
Mid-Atlantic Region
Ocean Discovery, Steel Pier
Atlantic City, NJ
(609) 345-1344

Hal and Carole Longworth
c/o Laser (Oceanic Society)
8081 Calle del Cielo
La Jolla, CA 92037
(714)459-7387

Dr. Michael Herz
San Francisco Bay Chapter
Building 240, Fort Mason
San Francisco, CA 94123
(415)441-5970

Resources for the Future, Inc.

1755 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Resources: Publications

Resources for the Future, Inc. is a private nonprofit corporation for research and education in the development, conservation, and use of natural resources. Established in 1952, most of its work has been supported by grants from the Ford Foundation.

Research into marine resources funded or conducted by

Resources for the Future has focused on fisheries. The publications listed below, a sample of published reports on fisheries research, could be a source of background information for Courses by Newspaper discussions.

The Common Wealth in Ocean Fisheries: Some Problems of Growth and Economic Allocation by Francis T. Christy Jr. and Anthony Scott. This book examines international fishery resources and the legal and institutional framework within which the fisheries industry operates. (ISBN 0-8018-0118-4, $10)

Tuna: Status, Trends and Alternative Management Arrangements by Saul B. Saila and Virgil J. Norton. Paper number seven in Resources for the Future's International Studies of Fishery Arrangements, this series of studies focuses on the tuna industry and suggests alternative approaches for its specific problems. (0-8018-1614-3, $7.50)

These publications can be ordered from The Johns Hopkins University Press, Baltimore, MD 21218. A complete catalog of Resources for the Future publications is available from its Washington, D.C. address.

Save Our Seas

245 Second Street, N.E.
Washington, D.C. 20002

Resources: Newsletter

Founded in 1972, Save Our Seas (S.O.S.) is a citizen's group dedicated to mobilizing public support for the United Nations Resolution on law of the sea. Toward this end, Save Our Seas publishes a newsletter, *Sea Breezes*, to alert members of legislation affecting law of the sea issues. To subscribe to *Sea Breezes* (a $5 annual contribution is suggested) or for background information on legislation or international law of the sea negotiations, write Save Our Seas at the above address.

Seafarers International Union

675 Fourth Avenue
Brooklyn, NY 11232

National Maritime Union of America

36 Seventh Avenue
New York, NY 10011

Resources: Speakers

Both of these unions represent the unskilled seamen who serve the United States Merchant Marine and both maintain offices in major ports. Representatives of either organization could serve as resource persons in discussions of the life and training of the modern seaman. If there is no listing for either union in your local phone directory, contact the headquarters of each union for the name of a nearby contact.

Sierra Club

530 Bush Street
San Francisco, CA 94108

Resources: Speakers, magazine

The protection of ocean resources is a part of the Sierra Club's efforts to "maintain the integrity of ecosystems" and many issues of its magazine, *Sierra Club Bulletin*, feature articles on ocean-related topics. Found in many libraries, the *Sierra Club Bulletin* is available to nonmembers for $5 per year and to members free of charge.

Members of the club's chapters, now located in every state, frequently can serve as resource persons on topics in "Oceans: Our Continuing Frontier." If you are unable to locate a local chapter, contact the Sierra Club headquarters in San Francisco.

Sport Fishing Institute

608 Thirteenth Street, N.W., Suite 801
Washington, D.C. 20005

Resources: Publication, newsletter

In the more than twenty-five years since its founding, the Sport Fishing Institute has directed its energies toward research in fisheries ecology and water pollution and toward fish conservation education. Toward these ends, the institute sponsored the First Marine Recreational Fishery Symposium last year. Proceedings of this symposium, a helpful source of background information for Courses by Newspaper discussions, will be published this fall. To order a copy ($15 in hardcover, $12 in paperback), write the International Game Fish Association, 3000 East Las Olas Boulevard, Ft. Lauderdale, FL 33316.

The institute's chief educational tool is its *SCI Bulletin*, a newsletter about fish conservation developments published ten times annually. A subscription is included in the $10 membership fee. To subscribe or obtain more information about the Institute, contact their Washington, D.C., headquarters.

UN Associations of the U.S.A.

Headquarters: 833 UN Plaza, New York, NY 10017

Resources: Speakers, films, publications

Located in many communities throughout the country, UN Associations is composed of private citizens active in publicizing the world-wide work of the United Nations, including its lengthy Conference on Law of the Sea and its efforts in aquaculture research. A representative of this organization could assist in locating speakers and in securin United Nations films and publications on either topic. Consult your local phone directory or the New York headquarters for the nearest UN Association.

State Agencies and Interest Groups

Since the organization of each state's government is different, contact the office of your state senator or representative for information on state agencies that have jurisdiction over various marine-related affairs. Private organizations and interest groups generally are located in your state's largest cities or its capital and are listed in the phone directories of these places.

State Humanities Committees

(Locations in each state are listed below.)

Resources: Funding

The state-based humanities committees, funded by the National Endowment for the Humanities, were formed to stimulate dialogue between humanists and the public on matters of social concern. Community programs based on the Courses by Newspaper series may qualify for funding. For additional information on opportunities for financial assistance and funding guidelines, consult your state com-

mittee. Below are the names of executive directors and addresses and phone numbers of state humanities committees.

Jack Geren (205)324-1314
Executive Director
Alabama Committee for the Humanities and Public Policy
Box 700
Birmingham-Southern College
Birmingham, AL 35204

Gary Holthaus (907)272-5341
Executive Director
Alaska Humanities Forum
429 D Street, Rm. 211, Loussac Sogn Bldg.
Anchorage, AK 99501

Lorraine Frank 602)257-0335
Executive Director
Arizona Council on the Humanities and Public Policy
Arizona Bank Building, Suite 716
34 W. Monroe Street
Phoenix, AZ 85003

Anthony Dube (501)568-2200 Ext. 377
Executive Director
Arkansas Humanities Program
Student Services Bldg., University of Arkansas, Little Rock
Little Rock, AR 72204

Bruce Sievers (415)543-3865
Executive Director
California Council on the Humanities and Public Policy
111 New Montgomery St., 6th Floor
San Francisco, CA 94105

William Hynes (303)442-7298
Executive Director
Colorado Humanities Program
855 Broadway
Boulder, CO 80302

Marianne Barnaby (203)347-6888
Executive Director
Connecticut Humanities Council
287 High Street, Wesleyan Station
Middletown, CT 06457

Rona Finkelstein (302)738-8491
Executive Director
Delaware Humanities Council
2600 Pennsylvania Avenue
Wilmington, DE 19806

Mrs. Carolyn Fleming (813)476-9500 Ext. 374
Executive Director
Florida Endowment for the Humanities
Building 54, Room 128
University of West Florida
Pensacola, FL 32504

J. Preston Prather (404)542-5481
Executive Director
Committee for the Humanities in Georgia
c/o University of Georgia Center for
Continuing Education
Athens, GA 30601

Annette Lew (808)947-5891
Executive Director
Hawaii Committee for the Humanities
2615 S. King, Suite 3H
Honolulu, HI 96813

David Hansen (208)345-5346
Executive Director
The Association for the Humanities in Idaho
P.O. Box 424
Boise, ID 83701

Marvin L. Vawter (217)333-7611
Executive Director
Illinois Humanities Council
314 South Neil St., Room 203
Champaign, IL 62820

Donna Bucore (317)925-7195
Executive Director
The Indiana Committee for the Humanities
4200 Northwestern Avenue
Indianapolis, IN 46205

Philip L. Shively (319)353-6754
Executive Director
Iowa Board for Public Programs in the Humanities
Oakdale Campus
Iowa City, IA 52242

Marion Cott (913)357-0359
Executive Director
Kansas Committee for the Humanities
616 Merchants Bank Bldg., 8th and Jackson Streets
Topeka, KS 66612

Arthur E. Curtis (606)258-5932
Executive Director
Kentucky Humanities Council, Inc.
206 Breckinridge Hall, University of Kentucky
Lexington, KY 40506

David Boileau (504)865-9404
Executive Director
Louisiana Committee for the Humanities
Box 12, Loyola University
New Orleans, LA 70118

David Smith (207)773-5051
Executive Director
Maine Council for the Humanities
P. O. Box 7202
Portland, ME 04112

Maria M. Heyssel (301)837-1938
Executive Director
Maryland Committee for the Humanities and Public Policy
2 East Redwood St.
Baltimore, MD 21202

Nathaniel Reed (413)545-1936
Executive Director
Massachusetts Foundation for Humanities and Public Policy
237 E Whitmore Administration Building
University of Massachusetts
Amherst, MA 01002

Ronald Means (517)355-0160
Executive Director
Michigan Council for the Humanities
Department of Continuing Education
Room 7, Kellogg Center, Michigan State University
East Lansing, MI 48824

Lynn M. Smith (612)224-5739
Executive Director
Minnesota Humanities Commission
Metro Square
St. Paul, MN 55101

Cora Norman (601)232-5901
Executive Director
Mississippi Committee for the Humanities
P.O. Box 335
University, MS 38677

Robert Walrond (314)863-0100 Ext. 3164
Executive Director
Missouri State Committee for the Humanities, Inc.
6922 Millbrook Boulevard
St. Louis, MO 63130

Margaret Kingsland (406)243-6022
Executive Director
Montana Committee for the Humanities
University of Montana
Missoula, MT 59801

Michael J. Holland (308)234-2110
Executive Director
Nebraska Committee for the Humanities
RFD 2, Box 65A
Kearney, NE 68847

Elmer Cole (702)784-6587
Executive Director
Nevada Humanities Committee
P.O. Box 8065
Reno, NV 89507

Miriam L. Murphy (201)932-7726
Executive Director
New Jersey Committee for the Humanities
Rutgers University
137 Church Street
New Brunswick, NJ 08903

Stephen Taylor (603)469-3203
Executive Director
New Hampshire Council for the Humanities
Box 271
Meriden, NH 03770

Allen Gerlach (505)277-3705
Executive Director
New Mexico Humanities Council
300 Scholes Hall, University of New Mexico
Albuquerque, NM 87131

Ronald Florence (212)594-4380
Executive Director
New York Council for the Humanities
326 W. 42nd Street
New York, NY 10036

Warren Nord
Acting Director
North Carolina Humanities Committee
1509 Maryland Ave.
Durham, NC 27705

Everett Albers (701)227-2125
Executive Director
North Dakota Committee for Humanities and Public Policy
Box 136, Dickinson State College
Dickinson, ND 58601

Richard Wood (614)236-6879
Executive Director
Ohio Committee for Public Programs in the Humanities
2199 East Main Street
Columbus, OH 43209

James Vore (405)751-8694
Executive Director
Oklahoma Humanities Committee
11018 Quail Creek Road
Oklahoma City, OK 73120

Charles Ackley (503)229-4821
Executive Director
Oregon Committee for the Humanities
1633 S. W. Park Ave.
Portland, OR 97201

Robert M. Giannetti (717)524-1333
Executive Director
Public Committee for the Humanities in Pennsylvania
Bucknell University
Lewisburg, PA 17837

Thomas Roberts (401)521-6150
Executive Director
Rhode Island Committee for the Humanities
86 Weybosset, Room 307
Providence, RI 02903

Leland Cox (803)799-1704
Executive Director
South Carolina Committee for the Humanities
McCrory Bldg., 2801 Devine Street
Columbia, SC 29205

John Whalen (605)633-4823
Executive Director
South Dakota Committee on the Humanities
Box 35, University Station
Brookings, SD 57006

Jane Crater (615)298-4469
Executive Director
Tennessee Committee for the Humanities
Suite 300, Coleman Bldg.
3716 Hillsboro Rd.
Nashville, TN 37215

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Other Resources

Directory of Marine Science Education, 1973

Published by Center for Wetland Resources
Louisiana State University
Baton Rouge, LA 70803

Resources: Listing of marine science teachers

This publication lists by state teachers involved in marine education in elementary and secondary schools. These educators could be asked to participate in community discussions of the Courses by Newspaper topics. If this directory is not available in local libraries, it can be ordered for a $2 fee from the Center for Wetland Resources, Coastal Studies Building, Louisiana State University, Baton Rouge, LA 70803.

Journal of Marine Education

P.O. Box 3085
Newport Beach, CA 92663

Resources: Publication

The full-color quarterly *Journal of Marine Education* is designed to support the introduction of marine-oriented instruction into every subject in the classroom. Featured are up-to-date articles written by respected experts in marine-related fields and lesson plans and teaching aids for creative in-the-classroom programs for primary, secondary, and college students. Subscriptions costing $12 a year are available by writing to the address listed above.

Scientific American Books and Offprints

W.H. Freeman and Company
660 Market Street
San Francisco, CA 94104

Resources: Publications

Many of the excellent articles on ocean topics that have appeared in *Scientific American* can be ordered as offprints from W. H. Freeman and Company, the magazine's publishers. The cost of each offprint is $.30. Below is a sample of available offprints that could be useful to both teachers and discussion leaders:

"Plate Tectonics" by John F. Dewey. As the rigid, shifting plates that constitute the earth's surface move, slide past each other, and converge, new crust is generated, continents drift, and mountains are formed. May 1972.

"Continental Drift and the Fossil Record" by A. Hallam. Similarities between the fossils found in widely separated

areas support the plate-tectonic theory. November 1972.

"Plate Tectonics and Mineral Resources" by Peter A. Rona. The concepts of continental drift and seafloor spreading provide clues to the location of economically important minerals such as oil and metals. July 1973.

"The Ocean and Man" by Warren S. Wooster. The increase of human activity in the sea presents deep problems in relations among nations. September 1969.

The September 1969 issue in which the Wooster article appeared was a special issue devoted to the oceans. Other articles from this issue that are available as offprints include "Man and the Sea" by Roger Revelle, "The Origin of the Oceans" by Sir Edward Bullard, "The Atmosphere and the Ocean" by R. W. Stewart, "The Continental Shelves" by K. O. Emery, "The Deep-Ocean Floor" by H.W. Menard, "The Nature of Oceanic Life" by John D. Isaacs, "The Physical Resources of the Ocean" by Edward Wenk Jr, "The Food Resources of the Ocean" by S. J. Holt, and "Technology and the Ocean" by Willard Bascom.

A catalog listing additional articles on oceans topics is available free from W. H. Freeman and Company.

Sea Grant '70s

Published by
Texas A&M University Sea Grant Program
College Station, Texas 77843

Resources: Publications

Sea Grant '70s, a monthly magazine published by Texas A&M's Sea Grant Program, features articles on research conducted at Sea Grant colleges and institutions throughout the country. If this publication is not available in your local library, it is available free of charge by writing *Sea Grant '70s* at the above address.

SECTION IV

A FILMOGRAPHY FOR "OCEANS: OUR CONTINUING FRONTIER"

This list of films, compiled to correlate with the Courses By Newspaper Fall 1976 study program, is a sampling from among the hundreds of films available on the ocean in all its aspects. The films are arranged alphabetically under each of the sixteen course topics; however, since a number of these films would be appropriate under several different topics, we recommend that you read through the entire list before selecting your program.

We have listed the primary distributor (the sales source) of the films. Many of these films also will be available from your local public library on a free loan basis, or from a university film rental library at a modest rental fee.

In addition to those included here, there are many more films sponsored by government and industry that deal with the navy, scientific exploration, and economic exploitation of the seas. Consult *The Educator's Guide to Free Films* for sources.

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Oceans: Our Continuing Frontier
An Annotated List of Films
Compiled by the Educational Film Library Association

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1. Our Continuing Frontier

THE ENDLESS SEA 28 min., color, 1971. Producer: The National Film Board of Canada. Distributor: Learning Corp. of America.

A dramatic film about the attraction the sea has always held for man and its practical importance to him. Presents a voyage on the C.S.S. *Hudson*, a Canadian ship designed for oceanographic study. Shows the infinite world of plankton and explores the continental shelf, the undersea mountains, and the abyss of the great deeps. Examines projects involving charting the ocean bed and training men to live underwater; investigates new fishing techniques and attempts to extract mineral reserves from the sea; shows research divers under five feet of arctic ice. Discusses misuse of the sea—oil spills and other ecological problems that will increase as man becomes increasingly dependent on the sea.

MAN IN THE SEA 26 min., color, 1972. Producer: Owen Lee. Distributor: Macmillan Films.

Regards diving as essential to future full utilization of the sea's potential. Examines the barriers of depth and time. Shows diving off a coral reef and considers the hazards of diving. Treats night diving, diving for treasure, underwater archeology, research submarines, and man's attempts to communicate with dolphins. From *The Endless Sea* series.

THE OCEANS: LIVING IN LIQUID AIR 22 min., color, 1971. Producer: Hobel-Leiterman Productions Limited. Distributor: Document Associates.

Surveys current research efforts toward human habitation of the oceans. Interviews with marine scientists, divers, and other experts show that stress from restricted underwater environments is minimal for up to sixty days. A shark research project is examined; it is hoped that man can learn to control the shark without killing it. Scientists believe that within the next generation man may develop methods for breathing liquid through his own lungs or with help from artificial gills. From the *Towards the Year 2000* series.

THE SIXTH CONTINENT 28 min., color, 1970. Director: Gilbert Lauzun for the United Nations. Distributor: McGraw-Hill Films.

The deep sea is considered the sixth continent in this overview of the increasingly important science of oceanography. Many times the size of the world's land area, the sea contains food, metals, protein, and petroleum, but no people. In future years, the oceans will have enormous impact on the social, political, and economic affairs of mankind if it can be kept pollution free, properly developed, and maintained as a peaceful international zone. Distinguished experts such as Jacques Piccard, Scott Carpenter, and Wernher von Braun describe their concerns about the deep sea. From the United Nations' *International Zone* series.

THOSE INCREDIBLE DIVING MACHINES 54 min., color, 1970. Producer: Jacques-Yves Cousteau with Wolper Productions. Distributor: Doubleday Multimedia.

Jacques Cousteau graphically traces man's historic attempts to probe the oceans' depths—from Alexander the Great's glass diving barrel to the development of the modern aqualung and mini-subs. The range of new scientific diving equipment and several record dives are shown.

2. Writers at Sea

CAPTAINS COURAGEOUS 116 min., B&W, 1937. Director: Victor Fleming. Distributor: Films Inc.

The story of a spoiled rich boy who, on his way to Europe aboard a luxury liner, falls overboard and is rescued by a Portuguese fisherman. On board a Grand Banks fishing schooner, he encounters an exciting and meaningful new life where he is put to work in the galley. Adopted by Manuel, his rescuer, he becomes his dorymate and helps with the season's catch. They race a rival schooner home to Gloucester. Manuel, aloft furling the fore tops'l, falls to his death when the topmast cracks. From Rudyard Kipling's popular novel written in 1895 when he visited Gloucester, then the capital of United States fishing. Spencer Tracy plays Manuel, with Freddie Bartholomew as the boy.

DOWN TO THE SEA IN SHIPS 54 min., color, 1968. Producer: National Broadcasting Company. Distributor: Films Inc.

Sweeping, poetic saga of the joys, hardships, fascination, and demise of the great sailing ships and the way of life they represented. Includes a brief history of sailing ships in America; rare, historic footage of clipper ships rounding Cape Horn; scenes of the 1957 Atlantic crossing of the replica of the *Mayflower*; spectacular footage of a great storm; and scenes of coast guard crews sailing the training ship *Eagle*. Many quotes from Melville, Conrad, and others who have written of the sea. Narrated by Burgess Meredith. From the *Project 20* series.

MUTINY ON THE BOUNTY 132 min., B&W, 1935. Director: Frank Lloyd. Distributor: Films Inc.

The feeling of the sea and of square rigged ships and the magic of the South Seas are imaginatively evoked in this celebrated and most successful first screen version of Nordhoff and Hall's 1932 best-selling historical novel about a 1788 mutiny. Charles Laughton plays Captain Bligh; Clark Gable is Fletcher Christian.

THE OLD MAN AND THE SEA 86 min., color, 1958. Director: John Sturges. Distributor: Macmillan Films.

An unusual film of the sea, this is a modern allegory that examines nothing less than how man conquers human failure and death. An old Cuban fisherman (played by Spencer Tracy), who fishes alone in a skiff in the Gulf Stream, has not caught a fish for 84 days. He goes out far beyond the usual fishing grounds, catches, then fights an epic battle with a huge marlin. The stubborn old man endures heroically, bringing the shark-torn 18-foot marlin home. Considered the first feature to succeed in capturing the full flavor of Ernest Hemingway's Pulitzer Prize-winning novel, it was carefully conceived to retain all the beauty of the prose and feeling for big game fish and the sea.

THE TRIAL OF BILLY BUDD 21 min., B&W, 1962. Director: Peter Ustinov. Distributor: Indiana University Audio-Visual Center.

This excerpt from the film based on the novella by Herman Melville presents an introduction to the author's philosophy of the relationships between innocence and depravity, justice and martial law. Pressed into wartime service on a man-of-war in the Royal Navy in 1797, young Billy Budd is both hated and envied by his master-at-arms, John Claggart. Unable to find fault with Budd's work or character, Claggart attempts to implicate him in a mutiny plan. When wrongly accused, Budd finds himself speechless, strikes and kills his accuser. Stars Terence Stamp, Peter Ustinov, Robert Ryan. The 123-min. feature film is available from Hurlock-Cine World.

TWO YEARS BEFORE THE MAST 98 min., B&W, 1946. Director: John Farrow. Distributor: Universal/16.

Relates the working conditions and the sailor's struggle for survival in the sailing ships of the early nineteenth century. These "iron men of the wooden ships" are shown clambering in the rigging, making sail, splicing hawsers, holystoning the decks, and fraternizing in the fo'c'sle. Richard Henry Dana wrote the narrative while sailing as a common seaman (1831–1833) around Cape Horn to California after interrupting his law studies at Harvard. Dana's account, published in 1840, aroused the populace and resulted in new laws to protect the merchant seaman. Stars Alan Ladd, with Brian Donlevy and Barry Fitzgerald.

THE VOYAGES OF SINBAD THE SAILOR: THE PRINCESS AND THE PEARLS 15 min., color, 1973. Director: Karel Zeman. Distributor: Learning Corp. of America.

Sinbad recalls one adventure at sea in which he almost dies of thirst, hunger, and finally drowning until he is saved by the magical powers of a friendly fish. A childhood fantasy from *Tales from the Arabian Nights*, with some lovely animation that captures the look of colorful Indian miniatures and makes this a visual delight for all ages.

3. Horrors of the Deep

THE GREEN SEA TURTLE 21½ min. & 54 min., color, 1970. Producer: Jacques-Yves Cousteau with Wolper Productions. Distributor: Doubleday Multimedia.

A fascinating Jacques Cousteau television segment that covers the large green sea turtles' water journey, sometimes from as far away as 1,000 miles, to lay their eggs above the high tide line on sandy island beaches. Inevitably, some mothers are trapped by beach obstructions and never make it back to the sea. And the babies, if hatched in daylight, are eaten by frigate birds that swoop the turtles up in their frantic scramble to the sea. A horror story softened by the Cousteau team's intervention. They save some trapped females and protect a crop of babies from the birds. Narrated by Cousteau and Rod Serling. Other Cousteau titles are also available from Doubleday.

MOBY DICK 116 min., color, 1956. Director: John Huston. Distributor: United Artists/16.

Herman Melville's symbolic tale of obsession on the high seas. With Gregory Peck as Captain Ahab, Richard Basehart as Ishmael, and Leo Genn as Starbuck.

MONSTERS: MYSTERIES OR MYTHS? 59 min., color, 1974. Producer: Wolper Productions and Smithsonian Institution. Distributor: Films Inc.

Investigates the legends of strange creatures in man's past and present, focusing on those creatures of contemporary interest such as the Abominable Snowman of the Himalayas, Bigfoot of the American Northwest, and the Loch Ness Monster of Scotland.

SHARKS: TERROR, DEATH, TRUTH 28 min., color, 1975. Director: Tom Bywaters for ABC-TV News. Distributor: Films Inc.

Explores the fascination with sharks that was brought to the fore by the movie *Jaws*. An analysis of "shark fever," with visits to beaches, fishing marinas, and with a fellow who almost had a foot severed by those powerful teeth. Also includes thoughts from author Peter Benchley, water safety tips, a look at some *Jaws* memorabilia (jewelry and clothing), and clips from the movie. Narrated by Peter Jennings.

UNDERCURRENTS 12 min., color, 1973. Director: Robin Lehman. Distributor: Phoenix Films.

A close-up look at undersea flora and fauna, with vibrating soundtrack, luminous color, beautiful lighting, and humor. In this world, even the smallest sea creatures take on mammoth and startling proportions. Unnarrated. Robin Lehman's other underwater films *See* and *Sea Creatures* are also available from Phoenix Films.

WE CALL THEM KILLERS 16 min., color, 1972. Director: Tom Shandel for the National Film Board of Canada. Distributor: Phoenix Films.

The first half of this short film covers the fun tricks of two performing, captive killer whales at Sealand of the Pacific in Victoria, British Columbia. The second half highlights the work of a cetologist with these two whales who are nuzzled and tickled and respond like two sweet-tempered puppies. The whales also listen to flutist Paul Horn as he entertains them at poolside and provokes their response. Shows the beauty of interspecies communication and collaboration.

4. American Imagery and Visions of the Sea

ALFRED WALLIS—ARTIST AND MARINER 23 min., color, 1973. Director: Christopher Mason for The Arts Council of Great Britain. Distributor: Films Inc.

A profile of Alfred Wallis (1855–1942) sailor, tradesman,

and in later life, a painter of the sea. It is Wallis, the painter, who primarily concerns the voice-over reminiscenses here, as friends and relatives recall the simplicity of the man, his work, and life in St. Ives, Cornwall, England. Juxtaposes quaint areas in and around the seacoast of St. Ives with Wallis' primitive renditions. The soundtrack reverberates with waves and gulls.

THE RIME OF THE ANCIENT MARINER 28 min., B&W, 1953. Director: William M. Shull. Distributor: University of California Extension Media Center.

The great dramatic sea poem of Samuel Taylor Coleridge was illustrated by the most distinguished nineteenth-century wood engraver and illustrator, Gustave Doré. Using the total Coleridge narrative poem and the great collection of Doré illustrations, the camera moves with dramatic sense and pacing over Doré's imagery, giving unique strength and immediacy to both epic English poetry and graphic art, to bring to life again the ancient mariner, now believed to have been inspired by the saga of the H.M.S. *Bounty*.

SAND 10 min., color, 1972. Director: Saul Leyton. Distributor: Pyramid Films.

The man who made this film is a sculptor, and he demonstrates his skill with sand by carving (with assistants) a huge male/female lounging couple on a crowded beach. With seaweed hair and spray paint bikinis, the lifelike forms are eventually washed away by the tides.

A similar pop fascination with sand sculpting is shown in *Castles Made of Sand* (8 min., color, 1971. Producer: Paul Burnford. Distributor: Pyramid Films) in which a beach is filled with castle-building contestants. The skillful results are worth the wait.

Both films are hampered by banal musical scores. Neither has dialogue or narration.

TURNER 28 min., color, released 1972. Director: David Thompson for The Arts Council of Great Britain. Distributor: Films Inc.

Joseph Mallord William Turner (1775–1851) was a British-born painter of light. Much of his work centers on the sea and so does this film. The personality of the man is recalled in chatty voice-over; the screen is continually filled with his work; waves crash on ethereal ships; and wind whips through their billowy sails. Unnarrated. Gives no explanation for his fascination with the sea.

THE WORKS OF WINSLOW HOMER AND JOHN MARIN 7 min., color, 1965. Producer: Westinghouse Broadcasting Corp. Distributor: Films Inc.

Presents the work of the painters, including paintings of the coast of New England.

5. Exploration of the Sea

ASSAULT ON THE UNKNOWN 28 min., color, 1972. Producer: U.S. Dept. of the Navy. Distributor: Oceanographer of the Navy.

Exploration of the oceans is conducted from platforms that support and house the scientists and their equipment. The film shows the ships, submersibles, aircraft, offshore towers, buoys, and bottom crawlers that serve as platforms in the exploration of the oceans. Scientists and engineers discuss their work. Not visually exciting, but it does provide an excellent overview of the equipment used in underwater exploration.

DISCOVERY IN THE DEEP 5½ min., color, 1974. Producer/Distributor: Doubleday Multimedia.

Explains how the ship *Glomar Challenger* drills the ocean floor for samples, which scientists analyze to try to prove the theory of continental drift.

METHODS AND INSTRUMENTS OF OCEANOGRAPHY 18 min., color, 1970. Producer: Audio Productions. Distributor: John Wiley & Sons.

An adequate introduction to oceanographic methods and instruments. Some methods and instruments are explained and photographed clearly, and in some cases their operation is explained by animation. Useful only as a brief overview of oceanographic instruments.

PROJECT DEEP PROBE 29 min., color, 1969. Producer: NET. Distributor: Indiana University

The ship *Glomar Challenger*, which is capable of sending a probe 20,000 feet under the sea, is used to retrieve samples of the ocean floor for analysis to prove that the earth was once a single body of land.

SUB-IGLOO 20 min., color, 1974. Producer: National Film Board of Canada. Distributor: International Film Bureau.

Chronicles the Third Arctic Expedition led by Dr. J. A. Macinnis to explore the Arctic Ocean. A sub-igloo, a workroom and rest station, was anchored to the ocean's floor. Excellent underwater photography.

THE WORLD OF JACQUES-YVES COUSTEAU 52 min., color, 1966. Producer: National Geographic Society. Distributor: Films Inc.

In 1965, off the coast of Monaco at Cap Ferrat, six members of Cousteau's oceanographic team lived for one month 378 feet below the surface in *Conshelf-three*. This experiment proved that it was possible and more feasible to explore the deep sea-floor from an underwater base rather than from the surface. This dive also provided medical data on the effects of deep-sea pressure on the body. Although this film is ten years old, it is still interesting and can be easily used in junior-high through college classrooms.

6. A New World Picture

THE BIRTH OF LIFE 15 min., color, 1972. Producer: Owen Lee. Distributor: Macmillan Films.

How the sea was formed and life evolved from it; how the earth's climate is affected by the sea; the role of plankton and phytoplankton; the function of the water cycle. A basic film that reveals how the forces of the sea determine the existence and survival of all life on earth. From *The Endless Sea* series.

CONTINENTAL DRIFT 10 min., color, 1971. Producer: National Film Board of Canada. Distributor: Universal Education and Visual Arts.

Uses model-animation to present the theory that our continents were formed from part of one supercontinent

that broke up. These pieces sank, then rose once more, but far apart.

FIRE UNDER THE SEA: THE ORIGIN OF PILLOW LAVA 20 min., color, 1974. Producer: Lee Tepley. Distributor: Moonlight Productions.

Documents for the first time underwater lava flows and the formation of pillow lava. Filmed in Hawaii between 1969 and 1973. One can both see and hear the pillows forming. Could have more scientific content, but the film quality is good and will appeal to a wide audience.

THE NOT-SO-SOLID EARTH 30 min., color, 1971. Producer/Distributor: Time-Life Films.

Traces one of the most revolutionary findings of this century: the discovery of powerful forces deep within the earth that move continents and shift oceans. Shows how geologists, oceanographers, paleontologists, and mineralogists gather and analyze supporting data for the theory of continental drift.

THE RESTLESS EARTH: PLATE TECTONICS THEORY 58 min., color, 1972. Producer: NET. Distributor: Indiana University.

According to plate tectonics theory, the outer covering of the earth is made up of plates about forty miles thick that move in different directions at a rate of one or two inches a year.

7. Science and Ancient Sea Stories

ATLANTIS 50 min., color, 1975. Producer: Samuel S. Bishop. Distributor: Orpheus Films, Inc.

A documentary shot on location in the southern Aegean, primarily on the island of Santorini, an island with a gaping 37-square-mile hole in its center, now filled with ocean. It was the site of a Bronze Age explosive eruption that devastated 170,000 square miles of the southern Aegean and extinguished the brilliant Minoan civilization. This geological event, combined with the interesting archeological discoveries of a city of 30,000 found buried under Santorini's 150-feet of ash, seem to fulfill Plato's legend of the lost Atlantis. This is a fascinating film; useful for many purposes and with many audiences. The photography is beautiful, and the narration is very well done.

SUNKEN TREASURE 22 min., color, 1970. Producer/Distributor: Doubleday Multimedia.

Jacques Cousteau and the crew of the *Calypso* explore a shipwreck alleged to be the command ship of the New World Armada. On another occasion they search for Inca treasure, which they are unable to find; their adventure is recorded in the film *Lake Titicaca*, also available from Doubleday Multimedia.

8. Mineral Resources of the Ocean

CONQUERING THE SEA 25 min., color, 1967. Producer: CBS—TV NEWS. Distributor: McGraw-Hill Films.

As mineral and food resources on land are depleted, man will be forced to turn to the oceans for a new supply. This film shows that the sea contains chemicals and minerals enough to supply industrial needs for centuries and food enough to feed 15 billion people. Examines new techniques being developed to take advantage of the sea's potential. Produced for the *21st Century* series.

DIAMONDS UNDER THE SEA 25 min., color, 1965. Producer: Willard Bascom for Ocean Science and Engineering, Inc. Distributor; Oceanographer of the Navy.

Geologists on the *Xhosa* use seismic surveys coordinated with land-based radar beacons to map the ocean floor. Then divers using underwater television probe for rock samples. Another ship, the *Rockeater*, caps the search by drilling into a charted gravel deposit to bring diamonds from under the sea. AAAS Science Film Catalog.

ENERGY FOR THE FUTURE 17 min., color, 1974. Director: Bert Van Bork. Distributor: Encyclopaedia Britannica Educational Corp.

Solar energy and nuclear fuel hidden in the seas are among the possibilities for future sources of energy.

EYES OF INNER SPACE 19½ min., color, 1972. Producer/Distributor: Naval Undersea Center.

A concise and fascinating look at the various vehicles developed by the Naval Undersea Center to aid in exploring the oceans and in tapping their resources.

LOCATION NORTH SEA 16 min., color, 1974. Producer: John Armstrong. Distributor: BP North America.

Sponsored by the British Petroleum Company, this is the story of the giant oil jacket placed in the North Sea.

OFFSHORE 19½ min., color, 1973. Producer/Distributor: National Film Board of Canada. Rental: McGraw-Hill Films.

Shows the intense round-the-clock activities aboard an oil-drilling rig in search of oil deposits under the ocean.

P.O.G.O.—PENNZOIL OFFSHORE GAS OPERATORS 23 min., color. Producer: Pennzoil Company. Distributor: Modern Talking Picture Service.

Shows how and why P.O.G.O. explored the sea for natural gas.

9. Can the Sea Feed the Land?

DOWN TO THE SEA 30 min., color, 1975. Producer: National Film Board of Canada. Distributor: Centron Educational Films and the National Film Board of Canada.

An overview of the work of marine scientists seeking a better understanding of the biological and physical processes occurring in the oceans so that their resources can be more rationally harvested and conserved. A fisherman explains why herring too small to be taken are taken daily in vast numbers. A scientist describes methods of studying the inner space of the oceans. A biologist discusses management of fish stocks in the North Atlantic. Other topics include aquaculture—the farming of the seas; plankton—the beginning of oceanic life; the use of sonic tracking to study fish life patterns; and new equipment such as underwater television, hydrophones and submersibles.

FARMERS OF THE LAKE 25 min., color, produced 1970, released 1972. Director: Jean Dasque for Les Films de l'Adagio, France. Distributor: Davidson Films.

Shows the relationship to the sea of the people who raise oysters and mussels—agriculturists who, by necessity,

became aquaculturists. The complex processes and problems involved in farming the sea are depicted.

FOOD FROM THE SEA 16 min., color, 1972. Producer: Owen Lee. Distributor: Macmillan Films.

Scientists search the sea for new and inexpensive protein sources. Fish protein concentrate, a food additive that is odorless and tasteless, can be made from usually rejected fish in order to protect endangered species. Contrasts old and new fishing methods. Highlights kelp, algae, and oyster farms. From *The Endless Sea* series.

NORTH PACIFIC 27 min., color, 1966. Producer: National Film Board of Canada. Distributor: Universal Education and Visual Arts.

Depicts the cruise of a Canadian fisheries research vessel in the North Pacific. Animation is used to show the nature of primary production and its relation to upwelling phenomena. Fascinating details of fish-scale cataloging and a sequence on deep-ocean fishing to obtain valid fish distribution statistics make up for the more superficial treatment of physical and chemical oceanography. Suitable in senior high school or early college classes as part of an introductory course in aquatic ecology or oceanography. Suitable for general audience use as well.

PASTURES OF THE SEA 6 min., color, 1975. Producer: Audio Productions. Distributor: Doubleday Multimedia.

Part of the *Search—Encounters with Science* series. Covers the study of phytoplankton, which contributes the greatest amount of energy to the marine food chain. Many concepts and specific facts are covered in this useful introduction to underwater food chains.

SCIENCE AND THE SALMON FISHERY 6 min., color, 1975. Producer: National Science Foundation. Distributor: Doubleday Multimedia.

Shows the practical application of the study of ocean currents and their effect on the movements of fish, particularly salmon. Part of the *Search—Encounters with Science* series.

SEAWEEDS 22 min., color, 1971. Producer: National Film Board of Canada. Distributor: McGraw-Hill Films.

A study of marine agriculture, a relatively new and undeveloped industry that is supplementing the fishing industry in the maritime provinces of Canada. Provides background on the general types of seaweed harvested, its industrial and popular uses, and the need for continued scientific research in the area of seaweed farming.

10. Pollution: Is the Sea Dying?

THE DAY THE TIDE TURNED RED 27 min., color, 1975. Producer: U.S. Dept. of the Navy. Distributor: National Audiovisual Center.

How navy scientists are studying and controlling the red-tide phenomenon to prevent its poisonous effect on people and marine life.

DROP BY DROP TO THE SEA 22 min., color, 1974. Producer: James Ducher. Distributor: Q-ED Productions.

"If the ocean dies, mankind dies" is the pervasive theme of this film that introduces the viewer to the fundamental importance of the oceans. The viewer learns that the sea is the source of life and freshwater, the source of 70 to 80 percent of the oxygen in the air, and that phytoplankton in the sea is the base of the food chain. The disruptive influences of humans on the sea are also shown. This is an excellent general awareness film; suitable for junior high through college classes.

500 MILLION YEARS BENEATH THE SEA 24 min., color, 1975. Producer: Metromedia Producers Corporation. Distributor: Doubleday Multimedia.

This entertaining film tells the story of a South Pacific lagoon threatened by refuse dumped in the sea by a mining operation—which leads Jacques Cousteau to predict that the total mass of life may not be reduced by pollution but that most of the delicate and beautiful organisms will be replaced by hardy species that tend to be coarser, more drab, and less pleasing to humans.

MINAMATA 60 and 105 min., B&W, 1973. Director: Noriaki Tsuchimoto. Distributor: Odeon Films.

A retrospective history, individual case histories, and rehabilitation programs dealing with the mercury-poisoned Japanese people of the fishing village of Minamata.

OCEANS: THE SILENT CRISIS 24 min., color, 1972. Producer: ABC-TV. Distributor: Xerox Films.

A provocative study of the Mississippi River, which is polluted by arsenic, cyanide, mercury, and other industrial wastes, and which empties into the Atlantic Ocean.

THE POISONED SEA 27 min., color, 1973. Producer: Lee Tepley. Distributor: Moonlight Productions.

Explores the environmental problems associated with the complex interactions of sea urchins, kelp beds, and a sewage outfall in the shallow coastal waters off Palos Verdes in southern California. A useful film—provocative but not overly sensational. The information is generally accurate, and the differences of opinion on cause and effect are indicated.

11. Law of the Sea

THE COMMON SEA 26 min., color, 1974. Producer: U.S. Dept. of the Navy. Distributor: National Audiovisual Center.

Traces the historical development of international maritime law and shows the current developments and how they affect the navy and all sea users.

LAW OF THE SEA 28 min., color, produced 1970, released 1974. Producer: United Nations. Distributor: Journal Films.

An examination of the issue of who owns the fishing and mineral rights to the oceans. Discusses the state of maritime law as it applies to Iceland, Ecuador, Alaska, England, the Netherlands, Denmark, Norway, and the North Sea.

SECOND CHANCE—SEA 10 min., color, 1976. Producer: Faith Hubley and Hubley Studio. Distributor: Pyramid Films.

An animated, fast-moving history of the sea with emphasis on the "gold rush" to mine the ocean and to harvest the food and the resulting territorial disputes and the destruction of the seas.

WHO OWNS THE SEA? 49 min., color, 1973. Producer/Distributor: Canadian Broadcasting Company.

When Hugo Grotius defined the "freedom of the sea" doctrine in 1609, he did not foresee the new technology, which is depleting the seas of their resources at an astonishing pace, and the resultant scramble among the nations of the world to protect their "rights." Filmed along the coast of the Arctic, Atlantic, and Pacific Canada, this is an examination of the problems.

12. The Sea: Defensive Barrier or Invasion Path?

HISTORY OF THE U.S. NAVY—THE CIVIL WAR 19 min. (Part I), 20 min. (Part II), color, 1958. Producer: U.S. Dept. of the Navy. Distributor: National Audiovisual Center.

Part I explains the basic naval strategies of the North and the South, the resources of each, and the most significant events of the years 1861 and 1862, such as the battle between the *Monitor* and the *Merrimack* and the Battle of New Orleans.

Part II traces the significant events from the end of 1862 to the close of the war and indicates how the northern strategy effectively stymied the southern economy.

MISSION OCEANOGRAPHY 28½ min., color, 1966. Producer/Distributer: Oceanographer of the Navy (free loan). For sales, contact the National Audiovisual Center.

A history of the role of the navy and industry in utilizing the oceans for economic purposes and for defense.

SEA POWER—SEAS OF LIBERTY 28 min., color, 1968. Producer/Distributor: Oceanographer of the Navy.

Shows the impact of sea power on the economy and stresses the geopolitical aspects of the seas from the mid-eighteenth century to the present.

VICTORY AT SEA 78 min., B&W 1966. Producer: NBC-TV. Distributor: Films Inc.

Surveys the naval highlights of World War II, particularly the role of the United States. Compiled from a series of twenty-six films.

13. The Sea: Connector or Barrier?

DEEP SEA TRAWLER 18 min., color, 1969. Producer: Institut fur Film und Bild. Distributor: Films Inc.

From Bremen, West Germany, the modern deep sea trawler *Erlanger* puts to sea on two- to three-month voyages to fish off the coasts of Norway, Iceland, Greenland, and outh Africa. The modern trawler is an efficient seagoing factory that provides very comfortable living for her sixty-man crew. Giant mechanized trawl nets drag the sea floor when electronic fish detectors have located a catch. The multi-ton catches are power-hauled onto the amidship deck and the harvested fish are emptied into the processing hold where they are processed almost entirely by machine. With processing continuing night and day the ship's holds fill in half the time of older ships. From the *Man and His World* series.

LAND BENEATH THE SEA 24 min., color, 1967. Producer/Distributor: Oceanographer of the Navy (free loan). For sales, contact the National Audiovisual Center.

Explains why a thorough knowledge of the sea is essential for defense and for economic use.

SHIPPING 16 min., color, 1974. Producer/Distributor: ACI Media.

The history and development of marine transportation and its importance are explored through the eyes of a young student at the United States Merchant Marine Academy.

14. Ships and the Sailor

AEGEAN SPONGE DIVERS 27 min., color, 1965. Producer: Bengt Borjeson. Distributor: University of California Extension Media Center.

An ethnographic documentary on the Greek sponge fishermen of Kalymnos Island. It shows major activities of the islanders, including preparation of the ships, hiring of crews and advance payment of wages, ceremonial blessing of ships and equipment, festive celebration on the eve of the fleet's departure, and work on board the ships and underwater during the five-day voyage to the North African coast and the six months of cramped and monotonous life aboard during the diving season. Focuses on the divers' lives, showing how they are pressured into ignoring basic safety precautions—ascending too rapidly and overstaying their time underwater, practices that often result in crippling or even fatal cases of the bends.

THE JEAN RICHARD 23 min., color, 1963. Director: René Bonnière. Distributor: National Film Board of Canada.

The building, during the winter of 1959, of a 120-foot, 200-ton, wooden schooner, called a goelette, by sailors of the French Canadian village of Petite Rivière, fifty miles below Quebec. The goelette is named, by tradition, for its captain's young son, Jean Richard, the next male in the family who will go to sea.

THE LONELY DORYMEN: PORTUGAL'S MEN OF THE SEA 51 min., color, 1968. Director: George Sluizer. Distributor: films Inc.

Following a 450-year-old seafaring tradition, Portuguese cod fishermen use outdated methods to compete with modern Russian, European, and American fleets in the late 1960s. From Lisbon, thirty-three four-masted schooners put to sea for the six-month voyage to the Grand Banks off Newfoundland, the fog-bound North Atlantic, and the frigid Arctic waters. The film follows one of the ships; it anchors and the fishermen row off in their one-man dories to select an isolated spot where they play out hand-baited, 1,000-hook, mile-long hand lines. Finally, when its hold is filled with 1,000 tons of cod won the hard way, the schooner returns home and the crew receives $1,000 each. During the next six months they fish daily for sardines.

A 25-minute version of this film is available under the title *Portugal—Men of the Sea*,and another film documenting the subject is *The White Ship* , 1967, directed by Hector J. Lemieux, distributed by Schoenfeld Film Distribution Company, produced by the National Film Board of Canada.

POTEMKIN (BATTLESHIP POTEMKIN) 67 min., B&W, silent, 1925. Director: Sergei M. Eisenstein. Distributor: Macmillan Films.

The Soviet classic that centers upon the 1905 rebellion of sailors aboard the Royal Armoured Cruiser *Potemkin* and their success that inspired the people of Odessa as well as other ships in the Russian fleet to join them.

SEAWARDS THE GREAT SHIPS 29 min., color, 1960. Director: Hilary Harris. Distributor: Sterling Educational Films.

The classic documentary about shipbuilding on the Clyde River near Glasgow, Scotland, where every kind of ship is produced. It shows the events and problems that occur before the launching of a ship, including conception, creation on the drafting board, building, steel plating, and installation of engines. It studies the men who build ships on the Clyde and finds them "like other men, harder than some, tough in sinew, warm in spirit." The commentary is simple, sensitive, and poetic.

TWO FACES OF THE SEA 24 min., color, 1972. Producer: The Film Group Inc. Distributor: Association-Sterling Films.

Maine fishermen from Port Clyde, fifty-five miles northeast of Portland, live with the North Atlantic sea during its many moods to earn their livelihood. Documents the various types of Maine coast fishing, done the year round, showing that the lives of these seafarers are difficult but rewarding as they face hazardous weather and cooperate to harvest some of the world's finest seafood. It also portrays the life of a remarkable United States fishing community, where the "two faces" represent the sea as friend and enemy.

15. Women and the Sea

CAPE HORN PASSAGE TO CALIFORNIA 30 min., B&W, 1950. Director: Warwick M. Tompkins. Distributor: Classroom Film Distributors.

Following in the wake of the nineteenth-century sailing ships that transported gold miners and settlers to the West Coast, the schooner *Wanderbird*, in 1936/1937 sailed from Gloucester, Massachusetts, around Cape Horn to San Francisco in 120 days. Captain Warwick M. Tompkins, with his eight-member crew of family and friends, sails the fifty-seven-year-old North Sea pilot schooner—the smallest vessel to complete the dangerous voyage, and one of the last. Operation of the ship through a variety of weather, crew and family life on board and below deck, and preparation for the grueling passage around the Horn (where we see the crew literally pouring oil on the "troubled waters" of the Straits of Magellan) are documented. Two books by Tompkins also resulted from this voyage: *Two Sailors*, about his children, and *50 South to 50 South*, describing the voyage.

THE GLOUCESTERMEN 30 min., color, 1973. Producer: Mary Feldhouse Weber. Distributor: WGBH Educational Foundation.

A creative and appealing documentary that celebrates in song and story the golden age of the fishing schooners and Gloucester's legendary fishermen—dedicated to the 10,000 of their number who were lost at sea from 1623 to 1927. It features first person recollections of the days of sailing by people of Gloucester, including a man of 105, posed in appropriate nautical settings. The film touches on the women left behind, showing a traditional ceremony for lost seamen, described by the wife of a captain. Includes old film footage of the great schooners.

ISLAND IN THE CHINA SEA 33 min., color, 1975. Director: Norman Miller. Distributor: Fieldstaff Films.

Compares the lives of two families, one fishing and one farming, on a small island near Hong Kong. The fishing family lives on board their junk. They fish by nylon nets, send their children to school by boat, and go ashore only to fetch fresh water. The farming family raises vegetables, pineapples, and pigs. They can affford wristwatches and have time to watch television at night while the fishermen must continue seeking the fish best caught after sundown. The film reveals these cultures with sparse narration. Both farmer and fisherman tell why their life is better than the other's and the film points out that similar styles of living can be found side by side throughout the world. From the *Faces of Change* series.

SCANDINAVIAN SEAFARERS 15 min., color, 1972. Producer: The National Geographic Society. Distributor: Films Inc.

Like their predecessors throughout history, the people of Scandinavia live with and on the sea. Typical of today's seafaring Scandinavians is the Dyb family, shown sailing their family vessel *Lestaskjer* more than 350 miles from Norway's coast before preparing fishing lines and baiting hooks. From Spitzbergen to Greenland they search for cod for weeks at a time. In summer they set nets along the shores of Sweden to catch millions of eels migrating to their spawning grounds. Some of their children will continue to follow the sea while others will choose newly available opportunities in a changing world. Adapted from the television special, *The Last Vikings*.

THE VOYAGE OF THE BRIGANTINE YANKEE 51 min., color, 1967. Director: Ray Jewell. Distributor: Films Inc.

Chronicle of the eighteen-month voyage of a two-masted sailing vessel. Shows Skipper Irving Johnson and his wife with a crew of twenty-two amateur sailors leaving Gloucester, Massachusetts, passing through the Panama Canal, and visiting the Galapagos Islands, Moorea, Pentecost, and New Guinea, with a stopover at Pitcairn Island where they meet the descendants of the *Bounty* mutineers. Orson Welles narrates. From the *National Geographic* series.

16. From Work to Sport

EIGHTEEN FOOTERS 20 min., color, 1968. Director: Jack Rogers. Distributor: Australian Information Service.

Sydney's unique eighteen-foot racing sailboats, a class developed in the 1930s and Australia's most popular, are world famous for their unmatched speeds—up to thirty knots under ideal conditions. This film describes how they are designed, built, rigged, and raced, emphasizing the sport of racing them. Stepped with twenty-eight-foot

masts and "carrying sail like the Vikings," the boats crewed by "three barefoot trapeze artists perched on the rail, a maniac at the helm," fight for the lead. Concludes with the annual Eighteen Footer Race on the midsummer day after Christmas, capturing the thrill of sailing a most efficient boat to the limit of its capacity.

THE ENDLESS SUMMER 95 min., color, 1966. Director: Bruce Brown. Distributor: Macmillan Films.

This popular and least self-conscious sports movie/travelog is a loving tribute to surfing—the ancient sport of Hawaiian kings. Nearly evey surfing champion of the early 1960s is seen here at his best, but the film centers on two members of this envied fraternity, Robert August and Mike Hynson, as they set out to follow the summer surf from hemisphere to hemisphere with (magically) all expenses paid. Bruce Brown's outstanding cinematography combined with his cool, humorous commentary make the film appealing to all audiences.

KON-TIKI 75 min., B&W, 1951. Producer: Artfilm. Distributor: Kit Parker Films.

A photographic record of the famous voyage from Peru to Polynesia—4,300 miles, 101 days—on a balsa raft bound by ropes. Thor Heyerdahl, expedition leader and author of the best-selling book, narrates with an effective mingling of informaton and affability, explaining the reasons for the journey—to prove the possibility of such a voyage by Peruvians 1,500 years earlier. The five Scandinavian scientists who accompanied him are introduced by Heyerdahl, who then relates the details of planning raft building, embarcation, voyage, and landing. The film was shot from a rubber raft, bobbing up and down in the sea, and there are only a few reconstructed effects. Introduction by Ben Grauer.

SAILING 13 min., color, 1964. Director: Hattum Hoving. Distributor: McGraw-Hill Films.

A visual essay that captures the exhilaration as well as the peaceful joys of sailing all kinds of craft in all sorts of weather, from children's sailing dinghies to fine racing machines, on calm summer days, during a squall, and after a storm. An exciting, evocative treatment of all phases of yachting, the film uses natural sound and appropriate music without narration.

THE SURFERS 24 min., color, 1964. Director: Robert Springer. Distributor: Macmillan Films.

Empathetically capturing the surfer's keen devotion to his sport, this remarkable film shows the excitement of the surfer's world, its status value, and mystique. Scenes of the great surfing beaches of Oahu's north coast, with their enormous, Aleutian-bred waves, show how the danger and challenge of these massive walls of water attract the most daring and devoted surfers. Sunset Beach's 25-foot waves climax this exciting view of the sport.

THERE ARE YACHTS AT THE BOTTOM OF MY GARDEN 10 min., color, 1973. Director: Jack Rogers. Distributor: Journal Films.

Many of the boat owners of Sydney, Australia live in harbor-front homes that literally have yachts at the bottom of the garden. The film shows their life on the water—boating for relaxation as well as the serious sport of ocean racing. Small children sail dinghies and adults maneuver stately, gaff-rigged yachts. The film concludes with the start of the annual Sydney to Hobart Yacht Race—600 miles through difficult waters.

Additional Resources

AAAS Science Film Catalog, edited and compiled by Ann Seltz-Petrash. New York: R.R. Bowker, 1975.

"Oceanography Films," a filmography compiled by the Office of the Oceanographer of the Navy, 200 Stovall Street, Hoffman II, Alexandria, VA 22332.

The Educational Film Library Association (EFLA), 43 West 61st Street, New York, NY 10023. Telephone: (212) 246-4533, acts as a clearinghouse for information about film. For assistance in locating additional films, write or call.

Educators Guide to Free Films, compiled and edited by Mary Foley Horkheimer and John C. Diffor. Wisconsin: Educators Progress Service, 1976.

DISTRIBUTORS

ACI Media, Inc.
35 West 45th Street
New York, NY 10036

Association-Sterling Films
866 Third Avenue
New York, NY 10022

Australian Information Service
636 Fifth Avenue
New York, NY 10020

BP North America
Film Library
620 Fifth Avenue
New York, NY 10020

Canadian Broadcasting Company
245 Park Avenue, 34th Floor
New York, NY 10017

Centron Educational Films
1621 West Ninth Street
Lawrence, KS 66044

Classroom Film Distributors, Inc.
5610 Hollywood Boulevard
Los Angeles, CA 90028

Davidson Films
3701 Buchanan Street
San Francisco, CA 94123

Document Associates
880 Third Avenue
New York, NY 10022

Doubleday Multimedia
Box 11607
1371 Reynolds Avenue
Santa Ana, CA 92705

Eccentric Circle Cinema Workshop
P.O. Box 4085
Greenwich, CT 06830

Encyclopaedia Britannica Educational Corp.
425 North Michigan Avenue
Chicago, IL 60611

Fieldstaff Films
American Universities Field Staff
3 Lebanon Street
Hanover, NH 03755

Films Inc.
1144 Wilmette Avenue
Wilmette, IL 60091

Hurlock-Cine World
13 Arcadia Road
Old Greenwich, CT 06870

Indiana University Audio-Visual Center
Bloomington, IN 47401

International Film Bureau
332 South Michigan Avenue
Chicago, IL 60604

Journal Films, Inc.
930 Pitner Avenue
Evanston, IL 60201

Kit Parker Films
Box 227
Carmel Valley, CA 93924

Learning Corp. of America
1350 Avenue of the Americas
New York, NY 10019

McGraw-Hill Films
1221 Avenue of the Americas
New York, NY 10020

Macmillan Films
34 MacQuesten Parkway South
Mount Vernon, NY 10550

Modern Talking Picture Service
45 Rockefeller Plaza
New York, NY 10020

Moonlight Productions
2650 California Street
Mountain View, CA 94040

National Audiovisual Center (GSA)
Washington, D.C. 20409

National Film Board of Canada
1251 Avenue of the Americas, 16th Floor
New York, NY 10020

Naval Undersea Center
Pasadena Laboratory
3202 East Foothill Boulevard
Pasadena, CA 91107

Oceanographer of the Navy
Commanding Officer
Naval Education and Training Support Center
Atlantic Naval Station
Building Z86
Norfolk, VA 23511

Odeon Films
1619 Broadway
New York, NY 10019

Orpheus Films, Inc.
8 Altair Avenue
Braintree, MA 02184

Phoenix Films, Inc.
470 Park Avenue South
New York, NY 10016

Pyramid Films
Box 1048
Santa Monica, CA 90406

Q-ED Productions
P.O. Box 1608
Burbank, CA 95107

Schoenfeld Film Distribution Company
Educational Division
165 West 46th Street
New York, NY 10036

Sterling Educational Films
241 East 34th Street
New York, NY 10016

Time-Life Films
Time and Life Building
Rockefeller Center
New York, NY 10020

United Artists/16
729 Seventh Avenue
New York, NY 10019

Universal Education and Visual Arts
100 Universal City Plaza
Universal City, CA 91608

Universal/16
445 Park Avenue
New York, NY 10022

University of California Extension
Media Center
2223 Fulton Street
Berkeley, CA 94720

WGBH Educational Foundation
125 Western Avenue
Boston, MA 02134

John Wiley & Sons, Inc.
605 Third Avenue
New York, NY 10016

Xerox Films
245 Long Hill Road
Middletown, CT 06457

SECTION V

ORGANIZATIONS TO JOIN

If you wish to play a part in determining the future of the world's oceans, consider joining the following organizations. Membership information for each can be obtained by writing to the organization's address listed below or by consulting its publication, generally found in local libraries.

AMERICAN CETACEAN SOCIETY
P. O. Box 2698
San Pedro, CA 90731
Publication: *Whalewatch*

THE COUSTEAU SOCIETY
777 Third Avenue
New York, NY 10017
Publication: *Calypso Log*

FRIENDS OF THE EARTH
529 Commercial
San Francisco, CA 94111
Publication: *Not Man Apart*

INTERNATIONAL OCEANOGRAPHIC FOUNDATION
3979 Rickenbacker Causeway
Virginia Key
Miami, FL 33149
Publication: *Sea Frontiers*

NATIONAL AUDUBON SOCIETY
950 Third Avenue
New York, NY 10022
Publication: *Audubon*

NATIONAL GEOGRAPHIC SOCIETY
P. O. Box 2895
Washington, D.C. 20013
Publication: *National Geographic*

NATIONAL WILDLIFE FEDERATION
1412 16th Street, N.W.
Washington, D.C. 20036
Publication: *National Wildlife*

OCEANIC SOCIETY
111 Prospect Street
Stamford, CT 06902 Or 240 Fort Mason
San Francisco, CA 94123
Publication: *Oceans*

SIERRA CLUB
530 Bush Street
San Francisco, CA 94108
Publication: *Sierra Club Bulletin*

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